NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON.

VOL. V.

HISTORY OF QUADRUPEDS.

2

2777

NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON,

ILLUSTRATED WITH ABOVE SIX HUNDRED COPPER PLATES.

THE

HISTORY OF MAN AND QUADRUPEDS

TRANSLATED, WITH NOTES AND OBSERVATIONS,

BY WILLIAM SMELLIE,

MEMBER OF THE ANTIQUARIAN AND ROYAL SOCIETIES OF EDINBURGH.

A NEW EDITION,

CAREFULLY CORRECTED AND CONSIDERABLY ENLARGED, BY MANY ADDITIONAL ARTICLES, NOTES, AND PLATES,

AND

SOME ACCOUNT OF THE LIFE OF M. DE BUFFON.

BY WILLIAM WOOD, F. L. S.

IN TWENTY VOLUMES.

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ERRATA.

Page 86, note,	*for* "Δαχως"	*read*	Λαγὼς.
212,	"præcique"		præcipue.
228,	"præcique"		præcipue.
315,	"Indiæ"		India.
321,	"Μυςκος"		Μυϊκος.
330,	"hotis"		hortis.

NATURAL HISTORY.

OF WILD ANIMALS.

IN the history of man, and of domestic animals, we have seen Nature under restraint, seldom perfect, often changed and deformed, and perpetually encompassed with fetters, or loaded with foreign ornaments. She is now to appear naked, and adorned with simplicity alone; but her attractions will be heightened by native beauty, by the freedom of her demeanour, the sprightliness of her movements, and other marks of true dignity and independence. We are to see her traversing the surface of the earth, like a sovereign, dividing her empire among the animals, assigning to each his proper element, climate, and subsistence. We shall survey her in the forests, in the waters, and in the plains, dictating her simple but immutable laws, impressing upon every species indelible characters, dispensing her bounty with equity, compensating evil with good, giving to some strength and courage, ac-

companied with hunger and voracity; to others gentleness, temperance, and agility, attended with restlessness and timidity; and to all liberty, uniform manners, and ardour in love, which is always easily gratified, and always followed with a happy fecundity.

Love and liberty are the most inestimable gifts which Nature has to bestow. Do these animals we call *wild*, because they are not subject to our caprice, require more to render them completely happy? But they also enjoy a perfect equality; they are neither the slaves nor the tyrants of each other. The individual has no occasion, like man, to dread the rest of his species. They have peace among themselves, and war never approaches them, but from strangers, or from man. They have, therefore, great reason to fly from the human race, to conceal themselves from our observation, to take up their abode in solitudes remote from the habitations of men, to provide for their safety by all the resources afforded them by instinct, and to withdraw themselves from the power of man, using, in every manner, that liberty bestowed on them by Nature, at the same time that she has given them the desire of independence.

Some animals, and they are the most gentle, innocent, and tranquil, content themselves with retiring, and passing their lives in our fields. Those which are more fierce and suspicious, hide themselves in the deepest recesses of the forest. Others, as if they knew there was no safety on the surface of the earth, dig subterraneous

abodes, take refuge in caverns, or gain the summits of the most inaccessible mountains. Lastly, the most ferocious and formidable kinds, inhabit deserts only, and reign as monarchs in those burning climates, where man, equally savage as themselves, is unable to conquer them.

As all beings, however free, are subjected to physical laws; and, as the brute animals as well as man, feel the influences of the heavens and the earth, it appears, that the same causes which have softened and civilized the human species in our climates, have produced similar effects upon every other species. The wolf, which is perhaps the most ferocious animal in the Temperate Zone, is not nearly so terrible or so cruel as the tiger, the panther, and the lion of the Torrid Zone, or the white bear, the lynx, and the hyæna of the Frozen Zone. This difference, as if Nature, to give more harmony to her productions, had adapted the climate to the species, or the species to the climate, is not only general, but, in each particular species, the climate is formed for the manners, and the manners for the climate.

In America, where the heat under the same latitudes, is less, and the air and earth softer than in Africa, the tiger, the lion, the panther, have nothing formidable in them but the name. They are no longer those tyrants of the forest, those bold and intrepid enemies of man, those rapacious monsters, which perpetually thirst for blood and carnage. These animals, in America, generally fly from man, and attack not other wild beasts

with open force, but lie in wait to surprise them: they may even be subdued, and almost tamed.

Hence, if ferociousness and cruelty were natural to them, they must have degenerated, or rather felt the influence of climate. Under a mild climate, their nature has been softened; every excess of temper has been moderated; and these changes have only rendered them more conformable to the quality of the country they inhabit.

The vegetables which cover the earth, and are more closely connected with it than the animal that feeds upon them, participate also more of the nature of the climate. Every country, every degree of temperature, has its peculiar plants. At the foot of the Alps, we find the vegetables of France and Italy, and, on their summit, those of the northern regions: we even meet with the same plants on the frozen ridges of the African mountains. On the south side of the mountains which divide the Mogul empire from the kingdom of Cashmire, we see all the Indian plants, and we are surprised to find, on the opposite side, nothing but the European kinds. Intemperate climates likewise produce drugs, perfumes, poisons, and all vegetables whose juices are highly exalted. The productions of temperate climates, on the contrary, are always mild: the softest and most wholesome herbs, the sweetest fruits, the gentlest animals, and the most polished men, are peculiar to those happy climates. Thus the earth produces plants, the earth and plants make animals, and the earth, plants, and

animals, give birth to man; for the qualities of vegetables proceed immediately from the earth and the air; the temperature and other relative qualities of herbivorous animals are derived from the plants upon which they feed; and the physical qualities of man, and other creatures which are nourished partly by flesh, and partly by plants, depend, though more remotely, on the same causes, whose influence extends even to dispositions and manners. Figure and size, which appear to be absolute and determined qualities, depend, however, like the relative qualities, upon the influence of climate, and concur in proving that every thing is moderate in temperate regions. The size of our largest quadrupeds has no proportion to that of the elephant, the rhinoceros, or hippopotamus. Our largest birds are small, when compared with the ostrich, the condor, or the cassawary; and what comparison is there between the fishes, the lizards, and the serpents of our climates, with the whale, the walrus, and manati, which people the northern seas; or the crocodiles, the large lizards, and the enormous serpents which infest the land and waters of the south? And, if we examine each species in different climates, we shall find sensible varieties both in size and figure *. These changes are produced in a slow and imperceptible manner. Time is the great workman of Nature. He moves with regular and uniform steps. He

* See the History of the Horse, vol. iv. p. 63; Goat, vol. iv. p. 292; Hog, vol. iv. p. 308; and Dog, vol. iv. p. 337.

performs no operation suddenly: but, by degrees or successive impressions, nothing can resist his power; and those changes which, at first, are imperceptible, become gradually sensible, and at last are marked by results too conspicuous to be misapprehended.

Wild and free animals, without excepting man, are, of all animated beings, least subject to changes or variations of any kind. As they are at absolute liberty in the choice of their food and their climate, their nature is more permanent than that of domestic animals, which are enslaved, transported, maltreated, and fed, without consulting their inclination or taste. Wild animals live perpetually in the same manner. They never wander from climate to climate. The wood where they are brought forth is a country to which they are faithfully attached, and they never depart from it, unless they perceive that they can no longer live there in safety. They fly not so much from their natural enemies, as from the presence of man. Nature has furnished them with resources against the other animals, and put them on a level; they know their strength, their address, their designs, their haunts, and, if unable to avoid them, oppose force to force: in a word, they are species of the same genus. But how can they defend themselves against a being who is able to seize without seeing, and kill without approaching them?

It is man, therefore, who disturbs and disperses wild animals, and renders them a thousand times more savage than they would naturally be; for

most of them require tranquillity only, and a moderate use of the air and earth. Nature even teaches them to live together, to unite into families, and to form societies. In countries not totally engrossed by man, some vestiges of these societies still remain. We there perceive common works carried on, designs that, though not founded on reason, appear to be projected upon rational conventions, the execution of which supposes union at least, and a joint co-operation of labour. It is not by force or physical necessity, like the ants, the bees, &c., that the beavers labour and build houses; for they are neither constrained by space, nor time, nor number, but unite from choice. Those which agree, dwell together; and those which do not agree, remove; and some of them have been remarked, which, being constantly repulsed by others, were obliged to betake themselves to a solitary life. It is only in distant and desert countries, where they dread not the approach of man, that they incline to render their dwellings more fixed and commodious, by constructing houses, or a kind of villages, which have no small resemblance to the feeble and primitive efforts of a nascent republic. In countries, on the contrary, spread over by men, they carry terror along with them. The society of animals is then at an end. All industry ceases, and every art is stifled. They think no more of building, and neglect every conveniency. Perpetually pressed by fear and necessity, their only desire is the bare preservation of life, and their only occupation is flight and concealment. If

the human species, as is reasonable to suppose, shall, in the progress of time, people equally the whole surface of the earth, the history of the beaver, in a few ages, will be regarded as a ridiculous fable.

We may, therefore, conclude, that the talents and faculties of animals, instead of augmenting, are perpetually diminishing. Time fights against them. The more the human species multiplies and improves, the more will the wild animals feel the effects of a terrible and absolute tyrant, who, hardly allowing them an individual existence, deprives them of liberty, of every associating principle, and destroys the very rudiments of their intelligence. What advances they have made, or may still make, convey little information of what they have been, or might acquire. If the human species were annihilated, to which of the animals would the sceptre of the earth belong?

8 A

Plate 66

STAG or HART

THE STAG*.

THE stag is one of those innocent, gentle, and peaceable animals, which seem to be destined to embellish and animate the solitudes of

* CERVUS.

CHARACTER GENERICUS.

Cornua solida, tenera corio hirto tecta apiceque crescentia, denudata, annua, furcata.

Dentes primores inferiores octo.

Laniarii nulli (interdum solitarii superius).

CHARACTER SPECIFICUS.

Cervus Elaphus. C. cornibus ramosis totis teretibus recurvatis.—*Linn. Syst. Nat. Gmel.* i. p. 176.

Cervus cornibus teretibus ad latera incurvis.—*Briss. Regn. An.* p. 85, No. 1.

Cervus Elephus.—*Erxleb. Mam.* p. 301.

Cervus nobilis, ramis teretibus, omnibus notus.—*Klein Hist. Quadr.* p. 23.

Cervus.—*Plin.* viii. ch. 32.—*Gesn. Quadr.* p. 354.—*Aldr.* p. 769, fig. p. 774.—*Johnst. Quadr.* p. 82, pl. 32, 35.

Le Cerf.—*Buff. Hist. Nat. par Sonn.* xxiv. p. 67, pl. 4.

Stag.—*Penn. Hist. Quadr.* i. p. 114, No. 54.—*Brit. Zool.* i. p. 41, No. 6.—*Bew. Quadr.* p. 122.—*Shaw's Gen. Zool.* ii. p. 276, pl. 177.

HABITAT

in Europa; Asia boreali, nec non in America boreali.

W.

the forest, and to occupy, at a distance from man, the tranquil retreats of those gardens of Nature. The elegance and lightness of his figure, the commodiousness of his stature, the flexibility and springiness of his limbs, his grandeur, strength, and swiftness, and his head, which is rather adorned than armed with living branches, that, like the leaves of trees, are annually renewed, sufficiently distinguish him from the other inhabitants of the wood. As he is also the noblest of these animals, he ministers to the pleasure, and has occupied the leisure, of the greatest heroes. The exercise of the chase should always succeed, or rather precede, the fatigues of war. To know the management of horses and arms, are talents common to the warrior and the hunter. To be accustomed to fatigue, address, dexterity, and quickness of movement, so necessary for the support of courage, are qualities acquired in the chase, and extremely useful in battle. Hunting is a most delightful school of necessary art. It is the only amusement which entirely divests us of care, the only recreation that is not accompanied with ef-

The stag has long, upright, rounded, and much branched horns: the brow antlers are slender and sharp. The colour of the stag is generally a reddish brown, with some black about the face, and a black list runs down the hind part of the neck and between the shoulders. It grows to a large size; one killed in the county of Aberdeen weighed 18 stone Scottish weight, or 314lb. The horns of the American stag sometimes weigh 30lb. and are about four feet high. — *Penn. Synops. Quadr.* p. 49.

feminacy, and gives vivacity and pleasure, without languor or disgust.

How can men, who, from their situation in life, are perpetually harassed with company, be better employed than in hunting? Always surrounded with a multitude, teazed with the importunity of their demands, obliged to give their attention to affairs which are foreign to them, agitated by the solicitations of men of high rank, and constrained and fettered in proportion to their elevation, great men would feel only the weight of their own grandeur, and exist only for others, if they did not occasionally abstract themselves from a crowd of parasites and flatterers. To preserve self-enjoyment, to recal personal attachments, and receive private friendship, sentiments a thousand times more precious and interesting than all the ideas of grandeur, retirement from the tumult and business of the world is sometimes necessary; and what retirement can be more various and animated than the chase? what exercise more useful to the body? what amusement more agreeable to the mind?

Perpetual action, or intercourse with man, is equally painful as perpetual thinking. Nature never intended man for the contemplation of abstract subjects. To be occupied, without relaxation, in difficult studies, to lead a sedentary life, and to make the closet the centre of our existence, is equally unnatural as to pass our days in tumult and agitation, continually drawn along by the movements of other men, and obliged to

keep a jealous and constrained watch over our own conduct, looks, and gestures. Whatever ideas we may conceive of the dignity of human nature, it is apparent, that public exhibition is not existence, and that we are less fitted for thinking than for action, for reasoning than enjoyment. True pleasure consists in the unrestrained use of ourselves. Our best gifts are those we receive from Nature. She presents us with the useful and inexhaustible enjoyments which arise from the air, the earth, the fields, and the forests. Hence a taste for hunting, fishing, gardening, and agriculture, is natural to all men: and, in societies less complicated than ours, there are only two ranks, both of them connected with this mode of life; the nobles, whose business is arms and hunting; and the vulgar, who are occupied in cultivating the earth.

In polished societies, where every thing is improved and brought nearer perfection, to render hunting more delightful and sprightly, to ennoble this most beneficial and respectable of all exercises, it has been formed into an art. The chase of the stag requires a species of knowledge, which can only be learned by experience: it implies a royal assemblage of men, horses, and dogs, all so trained, practised, and disciplined, that their movements, their researches, and their skill, must concur in producing one common end. The huntsman should know the age and the sex of the animal; he should be able to distinguish, with precision, whether the stag he has *harbour-*

ed * with his hound be a *knobber* †, a young stag ‡, in his sixth or seventh year, or an old stag §. The chief marks which convey this intelligence are derived from the *foot* ‖, and the excrement. The *foot* of the stag is better formed than that of the hind, or female. Her *leg* ¶ is more gross, and nearer the heel. The impressions of his feet are rounder, and farther removed from each other. He moves more regularly, and brings the hind-foot into the impression made by the fore-foot. But the distance between the steps of the hind are shorter, and her hind-feet strike not so regularly the track of the fore-feet. As soon as the stag acquires his fourth horns, he is easily distinguished; but, to know the *foot* of a young stag from that of a hind, requires repeated experience. Stags of six, seven, &c., years, are still more easily known; for their fore-foot is much larger than the hind-foot; the older they are, the sides of their feet are the more worn **; the distance of their

* *To harbour* a stag, is to go round the place in which he has taken refuge, and to learn whether he has not escaped.

† *Knobber* is a stag after he passes his first year till he arrives at the third.

‡ In the third, fourth, or fifth year of his age.

§ A stag is said to be *old from* eight years, and upwards.

‖ *Foot* is used for the impression made on the ground by the foot.

¶ In the language of hunters, *leg* means the two bones behind the foot, which make an impression on the ground along with the foot.

** This mark is equivocal; for the wearing of the hoof depends much on the plainness or roughness of the country which the animals frequent.

steps is more regular than those of young stags; they always place their hind-foot exactly in the track of the fore-foot, except, when they shed their horns, the old stags *misplace* ‡, at this season, nearly as often as the young ones; but in this they are more regular than the hind or young stag, placing the hind-foot always at the side of the fore-foot, and never beyond, or within it.

When the huntsman, from the dryness of the season, or other circumstances, cannot judge by the foot, he is obliged to trace the animal backwards, and endeavour to find his dung. This mark requires, perhaps, greater experience than the knowledge of the foot; but, without it, the huntsman would be unable to give a proper report to the company. After the report of the huntsman, and the dogs are led to the refuge of the stag, he ought to encourage his hound, and make him rest upon the track of the stag till the animal be unharboured. Instantly the alarm is given to uncouple the dogs, which ought to be enlivened by the voice and the horn of the huntsman. He should also diligently observe the foot of the stag, in order to discover whether the animal has started, and substituted another in his place. But it is then the business of the hunters to separate also, and to recal the dogs which have gone astray after false game. The huntsman should always accompany his dogs, and encourage, without pressing them too hard. He

* *To misplace*, is to put the hind-foot out of the track of the fore-foot.

should assist them in detecting all the arts of escape used by the stag; for this animal has remarkable address in deceiving the dogs. With this view, he often returns twice or thrice upon his former steps; he endeavours to raise hinds or younger stags to accompany him, and draw off the dogs from the object of their pursuit: he then flies with redoubled speed, or springs off at a side, lies down on his belly, and conceals himself. In this case, when the dogs have lost his foot, the huntsmen, by going backwards and forwards, assist them in recovering it. But, if they cannot find it, they suppose that he is resting within the circuit they have made, and go in quest of him. But, if they are still unable to discover him, there is no other method left, but, from viewing the country, to conjecture where he may have taken refuge, and repair to the place. As soon as they have recovered his foot, and put the dogs upon the track, they pursue with more advantage, because they perceive that the stag is fatigued. Their ardour augments in proportion to his feebleness; and their scent becomes more distinct as the animal grows warm. Hence they redouble their cries and their speed; and, though the stag practises still more arts of escape than formerly, as his swiftness is diminished, his arts and doublings become gradually less effectual. He has now no other resource but to fly from the earth which he treads, and get into the waters, in order to cut off the scent from the dogs. The huntsmen go round these waters, and again put the dogs on the track of his foot. The stag,

after taking to the water, is incapable of running far, and is soon *at bay**. But he still attempts to defend his life, and often wounds the dogs, and even the huntsmen when too forward, by blows with his horns, till one of them cuts his hams, to make him fall, and then puts an end to his life by a blow of a hanger. They now celebrate the death of the stag by a flourish of their horns; the dogs are allowed to trample upon him, and at last partake richly of the victory by devouring his flesh †.

* When a stag is worn out with fatigue, he turns upon the hounds, and is then said to be at bay.

† Pennant tells us that stags are still found wild in the highlands of Scotland, in herds of 400 or 500 together, ranging at full liberty over the vast hills of the north. Some grow to a great size. "When I was at Invercauld," says Pennant, "Mr. Farquharson assured me, that he knew an instance of one that weighed eighteen stone Scots, or 314 pounds, exclusive of the entrails, head, and skin. Formerly, the great highland chieftains used to hunt with the magnificence of an eastern monarch; assembling four or five thousand of their clan, who drove the deer into their toils, or to the station their lairds had placed themselves in: but as this pretence was frequently used to collect their vassals for rebellious purposes, an act was passed, prohibiting any assemblies of this nature." Stags are likewise met with on the moors that border on Cornwall and Devonshire, and in Ireland on the mountains of Kerry, where they add greatly to the magnificence of the romantic scenery of the lake of Killarny.

The stags of Ireland, during its uncultivated state, and while it remained an almost boundless tract of forest, had an exact agreement in habit with those that range at present through the wilds of America. They were less in body, but very fat, and their horns of a size far superior to those of Europe, but in form agreed in all points. Old Giraldus speaks

Every season is not equally proper for hunting the stag with hounds. In spring, when the leaves begin to unfold and to adorn the forests, when the earth is covered with fresh herbage and flowers, their perfumes diminish the sensation of the dogs; and, as the stag is then in his greatest vigour, it is extremely difficult for them to come up with him. It is likewise a settled point among hunters, that, when the hinds are about to bring forth, the chase is most difficult, and that, at this period, the dogs often quit a fatigued stag, and pursue any hind which bounds before them. In the same manner, in the beginning of autumn, when the rutting season commences, the hounds hunt without ardour: the strong odour of love renders, perhaps, the scent more uninteresting; and perhaps, at this season, the odour of all stags is nearly the same. During the winter snows, it is also improper to hunt the stag; because the hounds have no acuteness of scent, and seem to pursue the foot rather by the eye than the nose. As, in this season, the stags find not sufficient nourishment in their retreats, they issue forth into the more open parts of the country, and even into the sown fields. They assemble in flocks in the month of December, and, when the frosts are severe, they seek shelter on the sea-

with much precision of those of Ireland. *Cervos præ nimia pinquedine minus fugere prævalentes, quante minores sunt corporis quantitate, tanto præcellentius efferuntur, capitis et cornuum dignitate* *.—Brit. Zool. v. i. p. 45 and 46, 8vo. ed.

W.

* Topogr. Hibern. c. 19.

coasts, or in covered places, where they lock themselves fast together, and acquire warmth by mutual respiration. When the rigours of winter decline, they frequent the borders of the forest, and make depredations on the rising wheat. In spring, they shed their horns, which fall off spontaneously, or by rubbing them gently against the branches of trees. It is seldom that both horns fall off at the same time, the one generally preceding the other a day or two. The old stags cast their horns first, which happens about the end of February, or beginning of March. An aged stag, or one in his seventh year, or upwards, does not cast his horns before the middle of March; a stag of six years sheds his horns in April; young stags, or those from three to five years old, shed their horns in the beginning, and those which are in their second year, not till the middle or end of May. But, in all this, there is much variety; for old stags sometimes cast their horns sooner than those which are younger. Besides, the shedding of the horns is advanced by a mild, and retarded by a severe and long winter.

As soon as the stags cast their horns, they separate from each other, the young ones only keeping together. They no longer haunt the deepest recesses of the forest, but advance into the cultivated country, and remain among brushwood during the summer, till their horns are renewed. In this season, they walk with their heads low, to prevent their horns from rubbing against the branches; for they continue to have

sensibility till they acquire their full growth. The horns of the oldest stags are not half completed in the middle of May, and acquire their full length and hardness before the end of July. Those of the younger stags are proportionally later, both in shedding and being renewed. But, as soon as they have acquired their full dimensions and solidity, the stags rub them against the trees, in order to clear them of a skin with which they are covered: and, as they continue this friction for several days successively, it is said *, that the horns retain the colour peculiar to the juices of the trees against which they have been rubbed; that they become red when rubbed against beeches and birches, brown against oaks, and black against elms and trembling poplars. It is likewise said, that the horns of young stags, which are smoother, take not so deep a tincture from the trees, as those of old stags, which are rougher, and closer covered with little prominences; because it is these prominences which retain the coloured juices of the trees. But I cannot believe that this is the true cause; for I have kept tamed stags in an inclosure, where there was not a single tree, and yet their horns were coloured in the same manner as in those which inhabit the forests.

Soon after the stags have polished their horns, they begin to feel the impressions of love. Towards the end of August, or beginning of September, they leave the coppice, return to the

* Le Nouveau Traité de la Venerie, p. 27.

forests, and search for the hinds. They cry with a loud voice; their neck and throat swell, they become perfectly restless, and traverse, in open day, the fields and the fallow grounds; they strike their horns against trees and hedges; in a word, they seem to be transported with fury, and run from country to country, till they find the hinds, or females, whom they pursue, and compel into compliance; for the female at first avoids and flies from the male, and never submits to his embraces till she be fatigued with the pursuit. The old hinds likewise come in season before the younger ones. When two stags approach the same hind, they must fight before they enjoy. If nearly equal in strength, they threaten, paw the ground, set up terrible cries, and attack each other with such fury, that they often inflict mortal wounds with the strokes of their horns. The combat never terminates but in the defeat or flight of one of the rivals. The conqueror loses not a moment in enjoying his victory, unless another rival approaches, whom he is again obliged to attack and repel. The oldest stags are always masters of the field; because they are stronger and more furious than the young ones, who must wait patiently till their superiors tire, and quit their mistresses. Sometimes, however, the young stags accomplish their purposes when the old ones are fighting, and, after a hasty gratification, fly off. The hinds prefer the old stags, not because they are most courageous, but because they are much more ardent. They are likewise more inconstant, having often several

females at a time; and, when a stag has but one hind, his attachment to her does not continue above a few days: he then leaves her, goes in quest of another, with whom he remains a still shorter time; and, in this manner, passes from one to another, till he is perfectly exhausted.

This ardour of love lasts only three weeks, during which the stags take very little food, and neither sleep nor rest. Night and day, they are either walking, running, fighting, or enjoying the hinds. Hence, at the end of the rutting season, they are so meagre and exhausted, that they recover not their strength for a considerable time. They generally retire to the borders of the forests, feed upon the cultivated fields, where they find plenty of nourishment, and remain there till their strength is reestablished. The rutting season of old stags commences about the beginning, and ends about the 20th of September. In those of six or seven years old, it begins about the 10th of September, and concludes in the beginning of October. In young stags, or those in their third, fourth, or fifth year, it begins about the 20th of September, and terminates about the 15th of October; and, at the end of October, the rutting is all over, except among the *prickets*, or those which have entered into their second year; because they, like the young hinds, are latest of coming into season. Hence, at the beginning of November, the season of love is entirely finished; and the stags, during this period of weakness and lassitude, are easily hunted down. In seasons when acorns and other nuts

are plentiful, the stags soon recover their strength; and a second rutting frequently happens at the end of October; but it is of much shorter duration than the first.

In climates warmer than that of France, the rutting time, like the seasons, is more forward. Aristotle informs us*, that in Greece it commences in the beginning of August, and terminates about the end of September. The hinds go with young eight months and some days, and seldom produce more than one fawn. They bring forth in May or the beginning of June, and so anxiously conceal their fawns, that they often expose themselves to be chased, with a view to draw off the dogs, and afterwards return to take care of their young. All hinds are not fertile; for some of them never conceive. These barren hinds are grosser and fatter than those which are prolific, and also come soonest in season. Some hinds are said to have horns like the stag, which is not altogether improbable. The young are not called *fawns* or *calves* after the sixth month; the knobs of their horns then begin to appear, and they take the name of *knobbers* till their horns lengthen into *spears*, and then they are called *brocks* or *staggards*. During the first season, they never leave their mothers. In winter, the stags and hinds, of all ages, keep together in flocks, which are always more numerous in proportion to the rigour of the season. They separate in spring: the hinds retire to bring forth;

* Aristot. Hist. Anim. lib. vi. c. 29.

and, during this period, the flocks consist only of knobbers and young stags. In general, the stags are inclined to associate, and nothing but fear or necessity obliges them to disperse. The stag is capable of generating at the age of eighteen months: those brought forth during the spring of the preceding year, cover the hinds in autumn; and it is presumable that these embraces are prolific. The following circumstances, however, may render this opinion doubtful: the stags have not then acquired above a half or two thirds of their growth, which is not completed till the eighth year of their age; and their horns continue to increase during the same period. But it ought to be remarked, that the fawn soon gathers strength; that, during the first, and even the second year, his growth is very quick; and that he has already a redundance of nourishment, because his horns are considerably long, which is the most certain mark of ability to impregnate. It is allowed that animals, in general, are not capable of procreating till they have nearly acquired their full growth. But those which have fixed seasons for rutting or spawning, seem not to observe this law. Fishes spawn and are prolific before they have attained a fourth, or even an eighth part of their growth; and, among quadrupeds, those which, like the deer kind, have determined seasons for rutting, procreate earlier than other animals.

There are so many relations between the nutrition, the production of the horns, the rutting, and the generation of these animals, that, to have

a clear conception of the particular effects which result from them, it is necessary to give a general recapitulation of what I formerly advanced on the subject of reproduction *. Generation depends solely on a redundance of nourishment. During the growth of an animal, which is always most rapid in infancy, the nourishment is entirely exhausted in the extension and developement of the body. Hence there is no redundance, consequently no production or secretion of seminal fluid, and, of course, young animals are incapable of procreation. But, when they have obtained the greatest part of their growth, the redundance of nourishment begins to manifest itself by new productions. In man, the beard, the hair, the prominency of the breasts, and the expansion of the organs of generation, appear at the age of puberty. In the brute creation, and particularly in the stag, this redundance produces effects still more remarkable, as the growth of the horns, the swelling of the testicles, the turgidity of the neck and throat, the fat, the rutting, &c. And, as the growth of the stag is at first very rapid, a year only passes before the redundance of nourishment begins to show itself by the production of horns: if brought forth in May, the rudiments of the horns appear in the same month of the following year; and they continue to lengthen and acquire solidity, in proportion to the quantity of nourishment taken by the animal. About the end of August, they are

* See vol. ii.

fully grown, and so dense and insensible, that the animal rubs them against the trees, in order to deprive them of the skin or scurf with which they are covered. At the same time, the fat, which is likewise produced by the redundance of nourishment, ceases to accumulate, and begins to be determined towards the organs of generation, and to excite in the stag that ardour of desire which renders him perfectly furious. That the production of horns, and the secretion of semen, depend on the same cause, is evident from this fact, that, when the organs necessary for the secretion of semen are destroyed by castration, the production of the horns is likewise prevented; for if this operation is performed after the horns are shed, they are never renewed; and if, on the contrary, it is done when the horns are perfect, they never fall off. In a word, after castration, the animal remains during life in the same condition it was before that operation. As it feels no longer the ardour of rutting, the concomitant symptoms likewise disappear. There is no longer any accumulation of fat or suet, no more turgidity of the neck and throat, and the disposition of the creature becomes more gentle and tranquil. The parts cut off, therefore, were necessary, not only for collecting the redundant nourishment, but likewise for pushing it to the surface of the body in the form of fat, and particularly to the top of the head, where it gives rise to the horns, and for giving vigour and spirit to the animal. Castrated stags, it is true, become fat; but they produce no horns; their neck

and throat never swell; and their fat is never so highly exalted as that of entire stags, which, in the rutting season, have an odour so strong as to be perceived at a great distance; and their flesh is so infected with it, that it is uneatable, offensive to the smell, and putrifies in a very short time; while that of the castrated stag may be preserved fresh, and eat at all seasons. The difference between the horns of stags of the same age, of which some are thick, and others thin and slender, which is solely owing to a defect of food, is another proof that the horns are produced by redundant nourishment: for a stag which inhabits a rich country, where he is not disturbed by dogs or men, but is allowed to feed and ruminate in peace, will always have the highest, widest, largest, and most branchy horns. But those which live in situations where they can neither find repose nor a sufficient quantity of food, will have horns with few branches, slender stems, and brow-antlers. Thus it is easy to judge, by the horns of the stag, whether he has lived in a rich and peaceable country, or the opposite. Those which are in a bad condition, have been wounded, or much disturbed by hunting, are seldom fat, or have fine horns; their rutting time is also later; and their horns are neither so soon shed nor renewed. Hence every circumstance concurs in demonstrating that the horns, like the seminal fluid, are nothing but the redundant and superfluous organic nourishment, which could not be exhausted in expanding and supporting the animal body.

It is, therefore, apparent, that penury of food both retards the growth and diminishes the size of the horns; and, perhaps, it is not impossible, by retrenching the quantity of food, to suppress entirely this production, without having recourse to castration. It is, however, certain, that castrated stags eat less food than those which are unmutilated; and the females of this species, as well as those of the fallow-deer, the roe, and the elk, have no horns, because they eat less than the males; and because, at the very time that a redundance of nourishment would naturally happen, they are with young, and, instead of showing itself externally, it is first exhausted in nourishing the fœtus, and afterwards in nourishing the fawn. The objection, that the female rein-deer has horns like the male, rather supports than weakens this argument; for, of all horned animals, the rein-deer, in proportion to his size, has the largest and most voluminous horns, often extending, before and behind, the whole length of the body. He likewise abounds most in fat *; and, besides, the horns of the female are much smaller than those of the male. This example, therefore, proves no more than that, when the redundance is so great as not to be exhausted by gestation and the growth of the fœtus, it breaks through the body, and forms a new production, as in the male, only smaller in size, because the quantity of redundant matter is less.

* La Venerie de du Fouilloux, p. 97.

What I have remarked concerning nourishment, ought not to be extended to the mass or volume of the aliments, but only to the quantity of organic particles, that living, active, and prolific matter which unfolds and supports all animated beings. The rest is nothing but dregs, which may be more or less in quantity, without inducing any change upon the body: and, as the *lichen rangiferinus*, or rein-deer liverwort, is the ordinary food of the rein-deer, and is more substantial than the leaves, the bark, or the buds of trees, it is not surprising, that this animal should have a greater redundance of organic particles, and, consequently, larger horns, and more fat, than the common stag. It must be acknowledged, however, that the organic matter which produces the horns, is not perfectly disengaged from useless particles, and that it preserves, after passing the body of the animal, marks of its former vegetable state. The horns of the stags shoot, grow, and are disposed like the branches of a tree. Its substance is, perhaps, less osseous than lignous. To use the expression, it is a vegetable grafted upon an animal, participating of the nature of both, and forming one of those shades by which Nature always bounds the extremities of her productions, and which she employs to connect substances that are greatly removed from each other.

In the animal, as formerly remarked *, both extremities of the bones grow at a time. The ful-

* See vol. iii. art. Old Age and Death.

crum upon which the extending power is exerted, is in the middle of the bone, which part is always first ossified, and from which the two extremes progressively recede, and continue soft till the bone acquires its full length. In the vegetable, on the contrary, only one extremity of the wood grows. The bud, which unfolds to form a branch, is attached to the old wood by its inferior extremity, and upon this fulcrum the power of longitudinal extension acts. This remarkable difference between the vegetation of bones and the solid parts of plants, does not take place in the horns of stags. On the contrary, nothing can be more similar to the growth of a tree. The horns extend at one extremity only, the other serving for a fulcrum. They are at first tender as an herb, and then harden like wood. The skin which covers and grows along with them is their bark, and it is rubbed off after they attain their full size. As long as they continue to grow, their extremities are soft; and they likewise divide into several branches. In a word, every circumstance is similar, and corresponds in the developement of both. Hence the organic particles, which constitute the living substance of the stag, still retain the impression of the vegetable; because they arrange themselves in the same order as the parts of plants. Here it is apparent, that matter has an influence upon form. The stag, which inhabits the forest, and feeds on the sprigs of trees only, takes so strong an impression from the wood, that he produces a species of tree, which preserves indelible and evident marks

of its origin. This effect, though singular, is not solitary, and depends on a general cause, which I have already pointed out.

Both in animals and vegetables, the character, or mould, of each species, is the most constant and unalterable thing in Nature: what is most variable and desultory, is the matter of which they are composed. Matter, in general, seems to be indifferent to all forms, and capable of receiving every possible impression. The organic or living particles of this matter pass from vegetables to animals, without destruction or alteration, and form equally the living substance of the herb, of the wood, of the flesh, and of the bones. According to this view, it appears that matter can never have any influence on form, and that no kind of food, provided the animal can extract the organic particles, and assimilate them by nutrition, could induce any change upon the form, or have any other effect than to support and expand the body, by modelling itself upon all the particles of the interior mould, and intimately penetrating them. What proves this point is, that animals which live upon herbage, a substance very different from that of their own bodies, extract from it materials sufficient for the production of flesh and blood, and that they are nourished and grow as well as animals who feed upon flesh alone. However, by examining Nature more minutely, we shall find, that the organic particles sometimes do not perfectly assimilate themselves to the internal mould, and that matter has often a sensible influence upon form.

Size, for example, which is one of the attributes of form, varies in every species, according to the difference of climate. The quality and quantity of flesh, two other attributes of form, change according to the difference of food. This organic matter, therefore, which the animal assimilates to its own body by nutrition, is not absolutely indifferent to the reception of every form, nor deprived of the original figure which it possessed. It retains some characters of its primitive state. It acts, therefore, by its proper form upon that of the organized body to which it affords nourishment; and, though this action is almost imperceptible, and infinitely inferior to the power which obliges the organic particles to assimilate themselves to the internal mould that receives them, yet, in the progress of time, sensible effects must result from it. The stag, who inhabits the forests, and lives solely upon wood, produces and carries about with him a species of trees, which is nothing but the redundant part of his nourishment. The beaver, who lives in the waters, and feeds upon fishes, has a tail covered with scales. The flesh of the otter, and of most water fowls, is a Lent diet, a kind of fishy flesh. We may, therefore, presume, that animals perpetually nourished by the same food, however strong the original impression of Nature, would, in process of time, acquire a tincture from the qualities of this food, and undergo a kind of transformation, by an assimilation contrary to the first. The nourishment would no longer assimilate itself entirely to the form of the animal,

but the animal would partly assimilate itself to the form of nourishment, as we perceive in the horns of the stag and the tail of the beaver.

In the stag, the horns are an accessory, a part foreign to the animal, and regarded as belonging to him only because it proceeds from his body. But it is really a vegetable production *, since it retains the characters of that vegetable from which it derives its origin, and resembles the wood of trees, in the manner of its growth, ramification, solidity, drying, and separation; for, after acquiring its greatest density, it ceases to extract nourishment, it falls spontaneously, like a ripe fruit from the branch. The very name given to this production in our language is an indication that it has been regarded as wood, and not as a horn, a bone, a tusk, &c. And, though this theory seems to be sufficiently established by the preceding reasoning, yet I ought not to pass over a fact recorded by the ancients. Aristotle †, Theophrastus ‡, and Pliny §,

* The impropriety of this assertion is too obvious to require a comment. *W.*

† Captus jam cervus est, hederam suis enatam cornibus gerens viridem, quæ cornu adhuc tenello forte inserta, quasi ligno viridi coaluerit.—*Arist. Hist. Animal.* l. ix. c. 5.

‡ Hedera in multis creatur, et quod mirabilius, visa est in cornibus cervi etiam aliquando. Commovit (inquit Jul. Scaliger apud Theophrastum) virum accuratum cervi cornibus hærens hedera; quid enim eo seminium detulit, &c.—Lib. ii. *de Caus. Plant.* cap. 23.

§ In mollioribus cervorum cornibus hedera coalescit, dum ex arborum attritu illa experiuntur.—*Plin. de Admirand. Auditionibus.*

tell us, that ivy has been seen growing round the young horns of stags. If this fact be true, and it may easily be determined by experiment, an analogy still more intimate will be established between the *wood* of the stag and that of trees.

The horns and tusks of other animals are not only different from the *wood* of the stag, but, in their growth, texture, and form, both external and internal, there is nothing analogous to wood. The nails, the claws, the hairs, the feathers, the scales of animals, grow, it is admitted, by a species of vegetation; but this vegetation differs widely from that of wood. The horns of ōxen, goats, antelopes, &c., are hollow within; but the wood of the stag is equally solid through its whole extent. The substance of these horns is the same with that of the nails, claws, and scales: but the horns of the stag resemble wood more than any other substance. The inside of all hollow horns is covered with a kind of *periosteum*, and they contain in their cavity a bone, or core, which supports them; they never shed, but grow during the life of the animal; and its age may be learned by their rings or annual circles. Instead of growing by their superior extremity, like the *wood* of the stag, they grow like nails, feathers, and hairs, by their inferior extremity. In the same manner, the tusks of the elephant, walrus, and wild boar, and all other animals, are hollow within, and grow only by their inferior extremity. Thus horns and

tusks have no more analogy to the *wood* of the stag, than nails, hairs, or feathers.

Vegetation may, therefore, be reduced to three kinds. The first, in which the growth proceeds from the superior extremity, as in plants, trees, and the *wood* of the stag; the second, where the growth advances from the inferior extremity, as in horns, nails, claws, hairs, feathers, scales, tusks, teeth, and other external parts of animal bodies; the third, in which the growth proceeds from both extremities at the same time, as in bones, cartilages, muscles, tendons, and other internal parts of animals. The material cause of all these three species, is the redundance of organic nourishment; and the assimilation of this nourishment by the internal mould, which receives it, is the effect. Thus the growth of an animal is always more or less rapid, in proportion to the quantity of this redundant nourishment; and, after the greatest part of growth is acquired, it is determined to the seminal reservoirs, endeavours to escape from the body, and to produce, by means of copulation, new organized beings. The difference between animals, which, like the stag, have fixed seasons, and other animals which can engender at all times, proceeds entirely from their manner of feeding. Man, and domestic animals, who have daily an equal quantity of food, and often too much, are perpetually in a capacity for procreation. The stag, on the contrary, and most wild animals, who suffer greatly in the winter for want of food, have then no-

thing redundant, and are incapable of generating till they recruit during the summer. It is immediately after this season that the stag begins to rut; and, by the great waste he suffers at this period, he continues during winter in a state of languor and debility. His flesh is then so meagre, and his blood so impoverished, that worms breed under his skin, which still augment his misery, and he does not get quit of them till the spring, when he acquires new life and vigour by the active nourishment furnished to him by the fresh productions of the earth.

I must here add a fact communicated to me by M. le Marquis d'Amezaga, who, to much learning, has joined great experience in the chase.

"Stags," he remarks, "shed their horns sooner or later in the month of March, in proportion to their ages. At the end of June, the horns of the old stag are long, and begin to tickle him. It is at this time, also, that the stags begin to rub off the skin which covers their horns. At the commencement of August, their horns begin to assume that consistence which they retain during the rest of the year. On the 17th of October, the attendants of the prince of Condé pursued a stag of six years old. This was the rutting season, when the stags are much less vigorous; but we were surprised to find the animal fly at a great rate, and lead near six leagues from his harbour.

"When this stag was seized, we found that his horns were white, and sprinkled with blood, as

they ought to be at the time they are rubbed against the trees; and that they had still rags of the skin which covers them during the time of their growth. His horns were diversified with many branches. All the hunters who were in at the death, expressed their surprise at these appearances. But their astonishment was augmented, when they wanted to remove his testicles; for none were to be found in the scrotum. But, after opening the body, two testicles were discovered in the abdomen, about the size of filberds, and we clearly perceived that he had never experienced the effects of the rut. It is well known, that during the months of June, July, and August, the stags are prodigiously loaded with fat, which is generally so entirely exhausted about the middle of September, that nothing but the muscular flesh remains. But this stag had lost none of his fat, because he was never in a condition for rutting. He had still another singularity; for in the right foot he wanted the middle bone, which, in the left was half an inch long, and as large and pointed as a tooth-pick.

"It is well known, that a stag, castrated when he has no horns, never afterwards acquires them, and that, if the operation is performed when his horns are in perfection, they remain in the same state during life. Hence it appears, that the very minute organs of generation above described, were sufficient to produce the annual change of horns; but that Nature has always proceeded slowly in the conformation of this ani-

mal; for we could discover no marks of any accident which could induce us to believe that the order of Nature had been deranged. It is therefore reasonable to suppose, that this retardation proceeded from the imbecility of the organs of generation, which, however, were sufficient to produce the fall and renewal of the horns, since the cabbage or burs demonstrated, that, at the time this stag was killed, he had had horns annually from the second to the sixth year."

These observations of the marquis d'Amezaga seem to prove, in a still stronger manner than any thing formerly remarked, that the fall and renovation of the stag's horns depend entirely on the presence of the testicles, and partly on their being more or less perfect; for, in the instance before us, the testicles being imperfect and too small, the horns, for that reason, in their growth, shedding, and renewal, were much later than in other stags.

Some other interesting facts have been communicated by the count de Mellin, chamberlain to his Prussian majesty. The following is what he wrote me on the subject of the stag and roedeer in his letter dated from the Chateau of Anizou, near Stettin, November 5, 1784.

"You say, M. le Comte, that famine retards the growth of the antler, and very considerably diminishes the volume; perhaps, even, it may not be impossible, by taking away a great portion of the food, entirely to suppress this production, without having recourse to castration. This has happened, monsieur; and I am able to say, that

your supposition is fully verified. A stag was killed one night by moon-light in a garden in the month of January. The huntsman who fired, took it for an old doe, and was very much surprised, on approaching, to find it an old stag, but without horns. He first examined the testicles, which were in good condition; but, on approaching the head, he saw that the lower jaw had been partly carried away by a shot long before. The wound was healed; but the difficulty the stag experienced in feeding, had deprived it of all superabundance, and had absolutely stopped the production of antler. This stag was so reduced, that it was nothing but skin and bone; and its antler, once shed, could never be renewed. The crowns were absolutely without new shoots, and simply covered with a velvety skin, as in the first days after the stag has cast its horns. This fact, perhaps unique, is very rare; it happened in the neighbourhood of the country I inhabit, and can be attested on oath, if required."

In a subsequent letter, M. Mellin related to me part of some experiments which he made by cutting off the antlers of stags, which, as in castration, deprived them of the power of propagating.

"It is clearly demonstrated that the testicles, and a superabundance of food, are the cause of the growth of antler in the stag, and of all animals bearing antlers; and that, therefore, the antler is the effect, and the superabundance the cause. But who would imagine that, in the

stag, there is a reaction from the effect to the cause, and that if we cut off the antlers of the stag immediately after they are renewed, that is to say, before the rut, we destroy his power of reproduction for that year? And yet nothing is more true. I have been convinced of it this year, by a very remarkable observation. In 1782, in a park of fallow-deer which I had on the side of my chateau, I enclosed a stag and a doe, both of the same age, and both perfectly tame. The park is of considerable extent, and, notwithstanding the deer which were in it, the abundance of food is so great, that the stag, immediately after the fall of the first horns, renewed an antler of ten divisions, bearing five antlets on each head: however, this stag became dangerous to those who walked in my park, which induced me to cut down all the heads beneath the primary antler. In autumn, this stag was in rut, covered the doe, and conducted itself like a veteran, but the doe did not conceive. The following year, 1783, the stag bore an antler stronger than the preceding; I cut it in the same manner; the stag was again in rut, but its connexion was not successful. The doe, which had never conceived, did not enter the park till the stag had lost its first horns, the only antler that I did not cut. The third year, 1784, the stag was larger and stronger than the oldest stag of my forests, and carried an antler of six antlets on each head, which I again cut down; and, although it became in rut, it again failed to produce. This induced me to leave the antlers the following

year, 1785, because the vigorous state in which the stag and doe were, made me doubt that their sterility might arise from my having always cut off the antlers, and the effect assured me, that I was right; for, in the preceding autumn, I perceived that the doe only suffered the approaches of the stag for a short time. She conceived, and this year, 1786, I have had a fawn, which still lives, and is large and vigorous; but for the doe, I lost her this year during the rut, the stag having wounded her with a blow of his antlers, of which she died some weeks after."

Thus the life of the stag is spent in alternate plenty and want, vigour and debility, health and sickness, without having any change introduced into his constitution by these opposite extremes. He lives as long as other animals which are not subject to such vicissitudes. As he grows five or six years, he lives seven times that number, or from thirty-five to forty years *. What has been reported concerning the longevity of the stag, merits no credit. It is only a popular prejudice, which prevailed in the days of Aristotle, and which that philosopher considered as improbable, because neither the time of gestation, nor of the growth of the young stag, indicated long life †. This authority ought to have abolished the prejudice; but it has been renewed, in the ages

* Nouveau Traité de la Venerie, p. 141.

† Vita esse perquam longa hoc animal fertur; sed nihil certi ex iis quæ narrantur videmus; nec gestatio aut incrementum hinnulli ita evenit quasi vita esset prælonga.—*Arist. Hist. Animal.* lib. vi. c. 29.

of ignorance, by a fabulous account of a stag taken by Charles VI. in the forest of Senlis, with a collar, upon which was written this inscription, *Cæsar hoc me donavit.* The love of the marvellous inclined men to believe that this animal had lived a thousand years, and had his collar from a Roman emperor, rather than to suppose that he came from Germany, where all the emperors take the name of *Cæsar*.

The horns of the stag augment annually both in height and thickness, from the second to the eighth year, and continue nearly in equal beauty during all the vigour of life. But, when he grows old, his horns decline. Our stags have seldom more than twenty or twenty-two antlers or palms; and this number, even when at the highest pitch of vigour and perfection, is by no means constant; for it varies every year according to the quantity of nourishment and repose the animal has enjoyed: the largeness of the horns depends on the same cause; and their quality is also determined by the kind of nourishment they receive. Like the wood of the forest, the *wood* of the stag is large, tender, and light, in moist and fertile countries, and short, hard, and heavy, in dry and barren regions.

The size and stature of the animals themselves likewise differ according to the places they inhabit. The stags which frequent the valleys, or hills abounding in grain, are larger and taller than those which feed upon dry and rocky mountains. The latter are low, thick,

and short. Neither are they equally swift; but they run longer than the former: they are also more vicious, and have longer hair on their heads. Their horns are commonly short and black, like a stunted tree, the bark of which is always of a darker colour. But the horns of the stags which feed in the plains are high, and of a clear reddish colour, like the wood and bark of trees which grow in a good soil. These little squat stags never frequent the lofty woods, but keep always among the coppices, where they can more easily elude the pursuit of the dogs. The Corsican appears to be the smallest of these mountain stags. He exceeds not half the height of the ordinary kind, and may be regarded as a terrier among stags. His colour is brown, his body is squat, and his legs are short; and what convinces me that the size and stature of stags in general depend on the quantity and quality of their food, is, that having reared one at my house, and fed him very plentifully for four years, he was much taller, thicker, and plumper, at that age, than the oldest stags in my woods, which are, however, of a very good size.

Pontoppidan, when speaking of the Norwegian stags, remarks, "that they are only found in the dioceses of Bergen and Drontheim; that they sometimes swim in flocks across the straits between the continent and the neighbouring islands, resting their heads upon each other's crupper; and that, when the chief of

the file is fatigued, he retires behind to repose himself, and the most vigorous occupies his place *."

It has been thought, that the stags of our forests might, by treating them with care and gentleness, as the Laplanders manage the rein-deer, be rendered domestic. Upon this subject, M. le Vicomte de Querhoënt has communicated to me the following fact. Stags were first brought to the Isle of France by the Portuguese. They are small, and of a grayer colour than those of Europe, from which, however, they derived their origin. When the French took possession of this island, they found great numbers of these stags, of which they destroyed a part, and the remainder took refuge in the most retired places. They are now rendered domestic, and some of the inhabitants keep large flocks of them.

I have seen, at l'Ecole Veterinaire, a small kind of stag, which was said to have been brought from the Cape of Good Hope. Its skin was interspersed with white spots, like that of the axis. It was called the *hog-stag*, because its legs were thicker, and it had not the same agility of body as the common kind. The figure of it is represented in the plate. Its length, from the muzzle to the extremity of the body, was only three feet four inches and a half; the legs were short, and the feet and hoofs very small; the colour yellow, mixed with white spots; the eye black

* Pontoppidan's Nat. Hist. of Norway.

and open, with large black hair on the upper eyelid; the nostrils black, with a blackish band at the corners of the mouth; the colour of the head the same with that of the belly, only mixed with gray, and brown on the chanfrin and sides of the eyes; the ears very large, garnished on the inside with white hairs, and with smooth hair mixed with yellow on the outside. The horns of this stag were eleven inches seven lines in length, and ten lines thick. The top of the back was browner than the rest of the body. The tail was yellow above, and white below; and the legs were of a brownish black colour*.

This animal seems to approach nearer to the

* Cervus Porcinus. C. cornibus gracilibus trifurcis, supra fuscus, subtus cinereus. —*Linn. Syst. Nat. Gmel.* i. p. 179.—*Schreb. Saeugth.* v. t. 251.

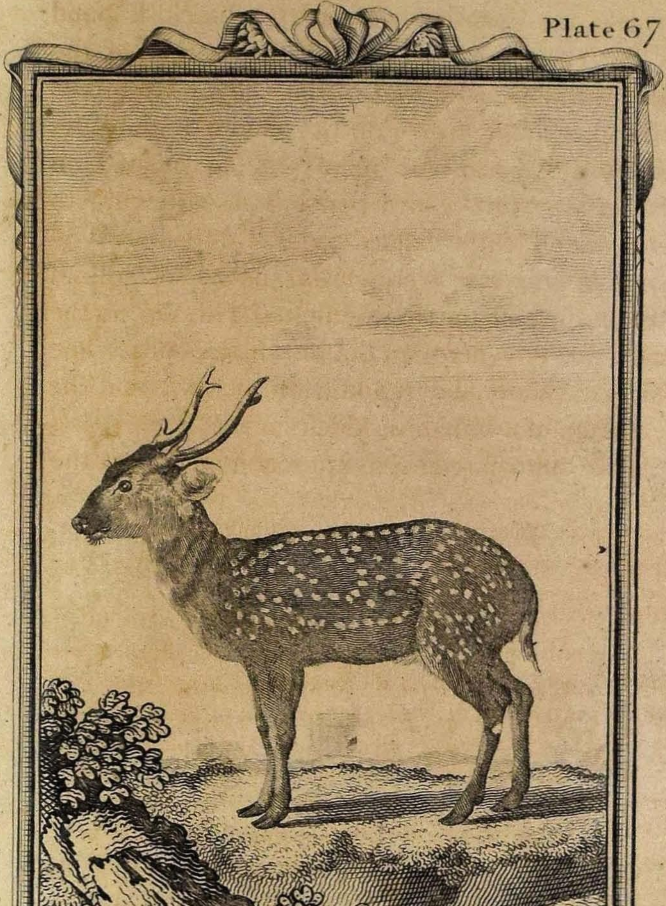
Porcine Deer.—*Penn. Hist. Quadr.* p 117, No. 59, pl. 19.

Pennant has given the following description of this deer. Horns slender, trifurcated, thirteen inches long: head, ten inches and a half long: body, from the tip of the nose to the tail, three feet six inches: height, from the shoulders to the hoof, two feet two inches; and about two inches higher behind: length of the tail eight inches: body thick and clumsy; legs fine and slender: colour on the upper part of the neck, body, and sides, brown; belly and rump, of a light colour.

The late lord Clive had one in his possession, brought from Bengal, and called, from the thickness of the body, hog-deer. The same species is also found in Borneo. They are caught in pit-falls about four feet deep, covered with some slight materials. Of their feet, says Mr. Pennant, as well as as of those of the lesser species of musks and antelopes, are made tobacco-stoppers.

There appears to be a sufficient difference between this and the common deer to establish a distinct species, although

Plate 67



A. Bell Sculp.

HOG STAG.

stag than the fallow-deer, as appears from the bare inspection of his horns.

Yellow is the most common colour of the stag. But many of them are brown, and others red. White stags are more rare, and seem to be a race that has become domestic, but very anciently; for both Aristotle and Pliny mention white stags; and they appear then to have been equally uncommon as at present. The colour of the horns, like that of the hair, depends on the age and nature of the animal, and the impression of the air. The horns of young stags are whitish, and less deeply coloured than those of the old. Stags, whose colour is a clear diluted yellow, have often pale, ill-coloured horns. Those which are of a lively yellow, have generally red horns; and brown stags, especially those which have black hair on the neck, have likewise black horns. The internal substance of the horns, it is true, is almost equally white in all stags; but they differ greatly in solidity and texture. Some of them are very spongy, and even contain pretty large cavities. This difference in texture is sufficient to account for their assuming different colours; and it is unnecessary to have recourse to the juices of trees, since we daily see the whitest ivory turn yellow or brown after being exposed

Buffon has placed it with the stag. Erxleben * has described it among his doubtful species. Sonnini says, that other naturalists are agreed to consider this as a variety of our deer.

W.

* Syst. Reg. Animal, p. 318.

to the air, though its texture be much more compact than that of the stag's horns.

The stag appears to have a fine eye, an acute smell, and an excellent ear.

It is well known, that, in many animals, as cats, owls, &c., the pupil of the eye contracts prodigiously in the light, and dilates in the dark. But this great contraction and dilatation had never been observed in the eyes of the stag. I received from M. Beccaria, a learned physician and celebrated professor at Pisa, the following letter, dated at Turin, October 28, 1767.

"I presented a piece of bread," says M. Beccaria, "to a stag that was confined in an obscure apartment, to allure him to a window, that I might admire at leisure the rectangular and transverse form of his pupils, which, in a strong light, exceed not half a line in width, by about five lines in length. In a fainter light, their breadth enlarges to more than a line and a half; but still preserve their rectangular figure: and, in passing from light to darkness, they dilate about four lines, but always transversely, that is, horizontally, and preserve their rectangular form. These facts may be easily ascertained, by laying the hand upon the eye of a stag; for, whenever the eye is uncovered, the pupil will be seen dilated above four lines."

From this fact, M. Beccaria concludes, with probability, that the other species of deer enjoy the same power of contracting and dilating their pupils. But, what is most remarkable, the pupils

of cats, owls, and several other animals, contract and dilate vertically, while that of the stag contracts and dilates horizontally.

When listening, the stag raises his head, erects his ears, and hears from a great distance. When he is going into a coppice, or other half covered place, he stops to look round him on all sides, and scents the wind, to discover if any object is near that might disturb him. He is a simple, and yet a curious and crafty animal. When hissed or called to from a distance, he stops short, and looks stedfastly, and with a kind of admiration, at carriages, cattle, or men; and, if they have neither arms nor dogs, he moves on unconcernedly, and without flying. He appears to listen with great tranquillity and delight to the shepherd's pipe; and the hunters sometimes employ this artifice to encourage and deceive him *. In general, he is less afraid of men than of dogs, and is never suspicious, or uses any arts of concealment, but in proportion to the disturbances

* Waller, in his ode to Lady Isabella, on her playing on the lute, has this allusion to the fondness of the animal for music:

> Here Love takes stand, and, while she charms the ear,
> Empties his quiver on the listening deer.

Playford, in his Introduction to Music, has the following curious passage to this purpose. "Myself," says he, "as I travelled some years ago near Royston, met a herd of stags, about twenty, on the road, following a bagpipe and violin; which, while the music played, they went forward; when it ceased, they all stood still; and in this manner they were brought out of Hampshire to Hampton Court." — *Penn. Hist. Quadr.* i p. 115. *W.*

he has received. He eats slow, and has a choice in his aliment; and, after his stomach is full, he lies down, and ruminates at leisure. He seems to ruminate with less facility than the ox. It is only by violent shakes that the stag can make the food rise from his first stomach. This difficulty proceeds from the length and direction of the passage through which the aliment has to go. The neck of the ox is short and straight; but that of the stag is long and arched; and, therefore, greater efforts are necessary to raise the food. These efforts are made by a kind of hiccup, the movement of which is apparent, and continues during the time of rumination. His voice is stronger, and more quivering, in proportion as he advances in years. The voice of the hind is shorter and more feeble. She never bellows from love, but from fear. The stag, during the rutting season, bellows in a frightful manner: he is then so transported, that nothing disturbs or terrifies him. He is, therefore, easily surprised; as he is loaded with fat, he cannot keep long before the dogs. But he is dangerous when at bay, and attacks the dogs with a species of fury. He drinks none in winter, nor in spring, the dews and tender herbage being then sufficient to extinguish his thirst. But during the parching heats of summer, to obtain drink, he frequents the brooks, the marshes, and the fountains; and, in the season of love, he is so overheated, that he searches every where for water, not only to satisfy his immoderate thirst, but to bathe and refresh his body. He then swims more

Plate 68

FEMALE RED DEER

Plate 69

SMALL RED DEER

easily than at any other time, on account of his fatness. He has been observed crossing very large rivers. It has even been alleged, that, attracted by the odour of the hinds, the stags, in the rutting season, throw themselves into the sea, and pass from one island to another at the distance of several leagues. They leap still more nimbly than they swim; for, when pursued, they easily clear a hedge or a pale-fence of six feet high. Their food varies in different seasons. In autumn, after rutting, they search for the buds of green shrubs, the flowers of broom or heath, the leaves of brambles, &c. During the snows of winter, they feed upon the bark, moss, &c., of trees; and, in mild weather, they browse in the wheat-fields. In the beginning of spring, they go in quest of the catkins of the trembling poplar, willow, and hazel trees, the flowers and buds of the cornel-tree, &c. In summer, when they have great choice, they prefer rye to all other grain, and the black, berry-bearing alder* to all other wood. The flesh of the fawn is very good; that of the hind and knobber not absolutely bad; but that of the stag has always a strong and disagreeable taste. The skin and the horns are the most useful parts of this animal. The skin makes a pliable and very durable leather. The horns are used by cutlers, sword-slippers, &c., and a volatile spirit, much employed in medicine, is extracted from them by the chemists.

* Rhamnus frangula, Linn.

THE FALLOW-DEER*.

NO species of animal makes so near an approach to another as the fallow-deer to that of the stag. But, though their similarity be great

* CHARACTER SPECIFICUS.

CERVUS DAMA. C. cornibus ramosis recurvatis compressis: summitate palmata. — *Linn. Syst. Nat. Gmel.* i. p. 178. — *Erxleben*, p. 309.

DAMA VULGARIS. Cervus cornuum unica et altiore summitate palmata. — *Briss. Regn. An.* p. 91, No. 7.

CERVUS PALMATUS, DAMA, DAMA CERVUS. — *Klein. Quadr.* p. 25.

CERVUS PLATYCEROS. — *Ray. Synop. An. Quadr.* p. 85.

Dama vulgaris sine recentiorum. — *Gesn. Icon. Anim. Quadr.* p. 51.

PLATYCEROS. — *Plin. Hist. Nat.* xi. c. 37.

EURYCEROS. Oppiani.

LE DAIM. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 134, pl. 8.

FALLOW-DEER. — *Penn. Hist. Quadr.* i. p. 113. — *Bew. Quadr.* p. 129. — *Shaw's Gen. Zool.* ii. p. 282, pl. 170 and 171.

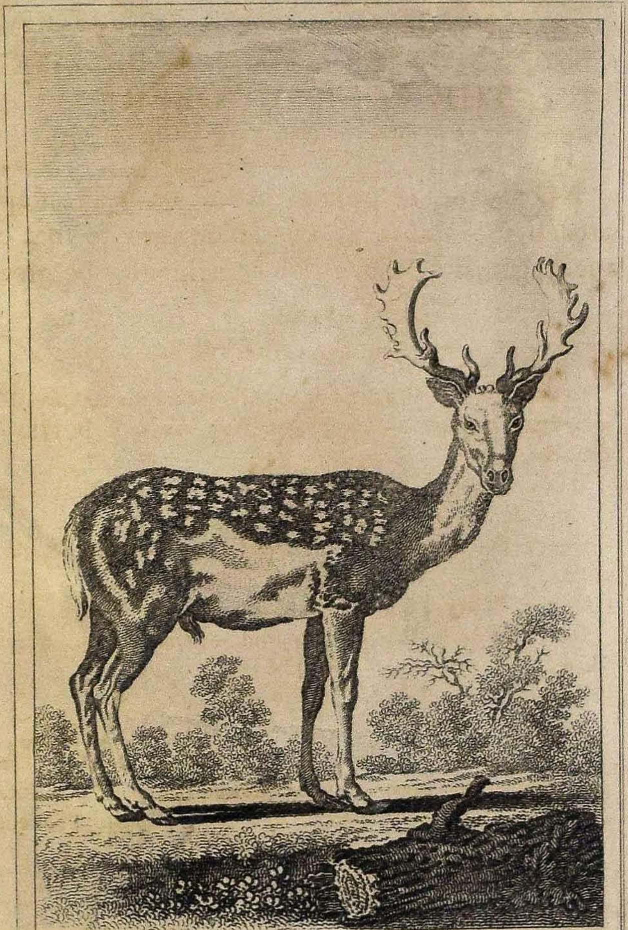
HABITAT

in Europa, Abundat in vivariis Angliæ. Forte quoque est in Africa. In Hispania magnitudine fere Elephum æquat.

W.

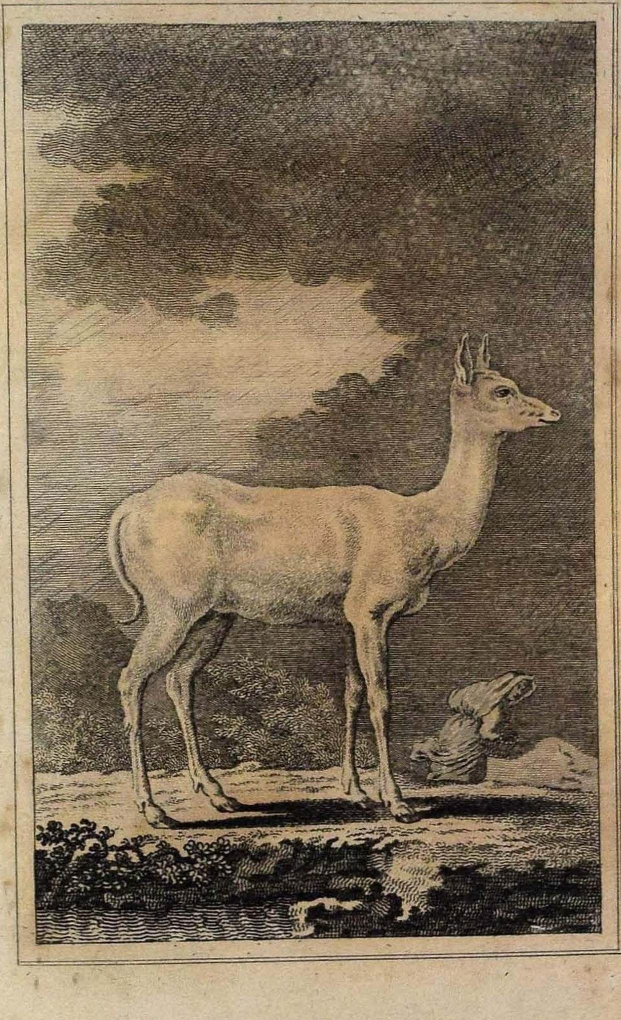
The horns of the fallow-deer are palmated at their ends, and branched on their hinder side. It has two slender brow-antlers, and above them two slender branches. The colour

Plate 70



FALLOW DEER

Plate 71



FEMALE FALLOW DEER

in every respect, they fly from each other, never intermix, and, of course, give rise to no intermediate race. It is even rare to find fallow-deer in a country much frequented by stags, unless they are industriously transported thither. Their nature seems to be less rustic and robust than that of the stag; and they are likewise less common in the forests. They are kept in parks, where they may be said to be half domestic. More of them are reared in England than in any other country of Europe; and the English are extremely fond of their venison. The dogs also prefer the flesh of this deer to that of all other animals; and, after they have once eat of it, they are extremely apt in the chase of the stag or roe-deer, to change their course when they perceive the scent of the fallow-deer. In some provinces of France, and in the neighbourhood of Paris, there are fallow-deer, as also in Spain and Germany *. Those of America were probably transported from Europe. It seems to

of this deer is various, being reddish, deep brown, white, or spotted.

In Greek, πρoξ; in Latin, *Dama;* in Italian, *Daino;* in Spanish, *Daino, Corza;* in German, *Dam-hirsch;* in Swedish, *Dof, Dof-hiort;* in Polish, *Lanii.*

* Fallow-deer are also found in Poland, and in Greece, where the thick forests which cover the mountains of that country afford shelter to great numbers. Hasselquit saw them in Palestine. Pennant assures us they are to be met with in the northern parts of China, and Zimmerman infers, from the accounts of several travellers, that they are equally common in the more temperate parts of Tartary.

W.

be an animal peculiar to the temperate climates; for there are none in Russia, and they are seldom met with in Sweden, or other northern countries *†.

The stags are more generally diffused over Europe; they are even found in Norway, and all the northern regions, Lapland, perhaps, excepted. They are also frequent in Asia, especially in Tartary ‡, and the northern provinces of China. They are likewise found in America; for those of Canada § differ from ours in the length of their horns only, and the direction of their antlers ‖, which is sometimes not straight, as in the common stag, but turned backward, so that the end of each points to the stem of the horns. But this form of the horns is not absolutely peculiar to the stag of Canada; for we find similar horns engraven in *la Venerie de du Fouilloux* ¶; and those of the Corsican stag have

* Linn. Faun. Suec.

† Thunberg thought he saw fallow-deer on the top of the Table Mountain, where they had ascended to enjoy the morning sun; but as the Swedish naturalist neither killed one himself, nor was near enough to distinguish them accurately, we may infer, that they were a species of antelope. The deer is not a native of Africa: if any exist at the Cape, they must have been introduced by the Dutch. *W.*

‡ Description de l'Inde, par Marc. Paul, liv. i. p. 38. Lettres Edifiantes, receuil 26, p. 371.

§ The Canadian stag is precisely the same with that of France.—*Description de la Nouv. France, par Charlevoix*, tom. xiii. p. 129.

‖ See the figure of the Canadian stag, in *l'Hist. des Animaux, par M. Perrault.*

¶ La Venerie de Jacques du Fouilloux, p. 22.

straight antlers; which is a sufficient proof that the Canadian stag is only a variety, to which stags of all countries are subject *. There are likewise horns which have a number of antlers on their summits, in form of a crown. These are rarely found in France; but, says Du Fouilloux †, they come from Russia and Germany. This is another variety only, and not a species different from the common kind. Hence, in Canada, as well as in France, most stags have straight antlers; but, in the former, they are larger and thicker; because they find, in these uninhabited regions, more nourishment and repose than in populous countries. There are large

* The horns of the Canadian stag are much thicker and larger than those of the stags of our climate. They have fourteen antlers, seven on each side, some of which are forked, and others simple.

Sonnini quotes the third volume *de l'Histoire de l'Academie des Sciences,* part the second, for a good figure of the Canadian stag; and adds, that it is sufficient to compare this with our European stag, to be satisfied that the two animals are one and the same species. However, many naturalists, (continues Sonnini,) doubtless struck more by the distance of the countries, than by the slight perceptible difference between the two stags, which does not amount to more than a variety, have separated the Canada stag, and formed it into a distinct species, which Klein has given under the name of *Cervus Canadensis,* and which Brisson has described as *Cervus cornibus teretibus, abimo ad summum cute pilosa tectis . . . Cervus varietas Canadensis.* Erxleben is content to mention it as a simple variety: *Cervus, varietas Canadensis, cornibus amplissimis . . . Cervus Canadensis.*—Mamm. Genn. 30, sp. 3, v. 9. Gmelin has followed Erxleben in his edition of the Syst. Nat. of Linné. *F.*

† La Venerie de Jacques du Fouilloux, p. 20.

and small stags in America, as well as in Europe. But, however generally this species is diffused, it seems to be limited to cold and temperate climates. The stags of Mexico and South America, those of Cayenne, those called *Gange stags*, mentioned in M. Perrault's Memoirs, under the name of *Sardinian hinds*, those denominated *Cape stags*, and those of Guinea, and other warm countries, belong not to the common species, as will appear when the particular history of each is given.

As the fallow-deer is less savage, more delicate, and approaches nearer to the domestic state than the stag *, he is also subject to a greater number of varieties. Beside the common and the white fallow-deer, there are several other varie-

* Though the fallow-deer is less savage than the stag, yet it loses its gentleness, when enclosed in a small space. Sonnini gives the following anecdote as a proof of this. In one of the enclosures in the *Jardin des Plantes*, there is confined (with several does) a buck, that was taken young in the *bois de Boulogne*. From being at first very tame, he is become fierce and mischievous, though he has not entirely forgotten his former familiarity. He still attends to his name, and approaches the gate, when any one calls him: he willingly receives bread through the rails, but will fly with fury at either men or dogs, if they enter his enclosure. Last year, a very fine dog was put into the enclosure, for the sake of chasing the deer. In an instant, the buck ripped up his belly with his horns; the master of the dog, willing to save him from the fury of his enemy, went in, but was immediately thrown down, by a blow from the stag, and his thigh opened from one end to the other. It was with the utmost difficulty that he escaped the death which his dog had just suffered.

ties, as those of Spain, which are nearly as large as the stag; but their neck is not so thick, and their colour is darker, with a blackish tail, not white below, and longer than that of the common kind; those of Virginia, which are almost as large as those of Spain, and remarkable for the great size of their genital organs *: others have a compressed forehead, with the ears and tail longer than those of the common fallow-deer, are marked with a white spot upon the hoofs of the hind-feet; others are spotted with white, black, and yellow; and others are entirely black. All these have their horns flatter, broader, and better garnished with antlers, than those of the stag; they likewise incline more inwardly, and are more palmated at the points; and, when the horns are very strong, the largest antlers are sometimes terminated by small palms. The tail of the common fallow-deer is longer than that of the stag, and its hair is brighter. The horns of the fallow-deer shed, like those of the stag; but they fall off later, and are renewed nearly at the same time. Their rutting season arrives fifteen days or three weeks after that of the stag. The males then bellow frequently, but with a

* Sonnini indirectly denies his assent to the specific distinction between this and our fallow-deer, by asserting, that it is not yet proved that the animal described by the name of Virginian deer, is any thing more than the same species as the European deer: he adds, upon what authority I know not, that the major part of the skins which come from America, under the name of deer-skins, are the skins of roe-bucks *.

W.

* Buff. par Sonn. xxiv. p. 136, note 3.

low and interrupted voice. They are not so furious as the stag, nor exhaust themselves by rutting. They never depart from their own country in quest of females; but they dispute and fight for the possession of their mistresses. They associate in herds, which almost always keep together. When there is a great number in one park, they generally form themselves into two distinct troops, which soon become hostile, because they both wish to occupy the same part of the inclosure. Each of these troops has its own chief, who marches foremost; and he is always the oldest and strongest of the flock. The others follow him; and the whole draw up in order of battle, to force the other troop from the best pasture. The order with which these combats are conducted is very singular. They make regular attacks, fight with courage, mutually support each other, and never think themselves vanquished by a single check; for the battle is daily renewed, till the weaker are completely defeated, and obliged to remain in the worst pasture. They love elevated and hilly countries. When chased, they run not out, like the stag, but double, and endeavour to conceal themselves from the dogs by artifice, and by substituting another animal in their place. However, when fatigued and heated, they take the water, but never attempt to cross such extensive rivers as the stag. Thus, between the chase of the fallow-deer and stag, there is no material difference. Their knowledge and instincts, their shifts and doublings, are the same, only they are more fre-

quently practised by the fallow-deer. As he is less enterprising, and runs not so far before the dogs, he has oftener occasion to change, or substitute another in his place, to double, return upon his former tracts, &c., which renders the hunting of the fallow-deer more subject to inconveniences than that of the stag. Besides, as he is smaller and lighter, the impressions of his feet upon the ground are slighter, and the branches he knocks off from the trees with his horns are smaller. Hence the dogs are less apt to observe the change, or substitution of another animal, and it is more difficult to bring them into the scent when at fault.

The fallow-deer is very easily tamed, and eats many substances which are rejected by the stag. He likewise preserves his fat or venison much better; for he is not rendered meagre by rutting, though followed by the longest and severest winters; and he is nearly in the same condition during the whole year. He browses closer than the stag, which makes the trees or bushes cut by him more difficult to shoot than those cut by the stag. The young fallow-deer eat quicker, and with more avidity, than the old. They ruminate; they search for the females in the second year, and attach not themselves to one, like the roe-buck, but love variety, like the stag. The female goes with young eight months and some days. Like the hind, she produces one, sometimes two, and very rarely three fawns. They are capable of engendering and producing from the age of two to that of fifteen or sixteen years.

Lastly, the fallow-deer resemble the stag in almost all their natural dispositions and habits; the greatest difference between these two animals consists in the duration of their lives. We formerly remarked, from the testimony of huntsmen, that the stag lives thirty-five or forty years; and, from the same authority, we learn that the fallow-deer live only about twenty years. As they are smaller, it is probable that their growth is sooner accomplished than that of the stag; because, in all animals, the duration of life is proportioned to the time of growing, and not to the time of gestation; for here the time of gestation is the same. Besides, in other species, as that of the ox, though the time of gestation be long, the duration of life is short. Of course, we ought not to measure the duration of life by the time of gestation, but by that of the growth, reckoning from birth, nearly to the full expansion of the body *.

* For a few supplementary remarks on the fallow-deer, see the article *Axis*.

ROEBUCK

Plate 73

FEMALE ROEBUCK

THE ROE-DEER*.

AS the stag is the noblest inhabitant of the wood, he occupies the deepest shades of the forest, and the most elevated ridges of those moun-

* CHARACTER SPECIFICUS.

CERVUS CAPREOLUS. C. cornibus ramosis teretibus erectis: summitate bifida; corpore fusco-rufo. — *Linn. Syst. Nat. Gmel.* i. p. 180. — *Schreb.* v. t. 252, A. B. — *Erxleben*, p. 313.

Cervus capreolus cornibus teretibus erectis. — *Briss. Regn. An.* p. 89. n. 5.

Cervus minimus, capreolus, cervibus caprea, cornibus brevibus ramosis, annuatim deciduis. — *Klein. Quadr.* p. 24.

CAPRA, sive capreolus et Dorcas. — *Gesn. Icon. An. Quadr.* p. 64.

CAPREA. — *Plin. Hist. Nat.* viii. c. 53, 58. — *Aldrov.* p. 738. — *Jonst.* p. 77. t. 31. — *Ray*, p. 89.

LE CHEVREUIL. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 156 pl. 8.

ROE. — *Penn. Hist. Quadr.* i. p. 120. — *Arct. Zool.* i. p. 33. *Bew. Quadr.* p. 132. — *Shaw's Gen. Zool.* v. ii. p. 291.

HABITAT

in Europa et Asia. Deest in Britannia australi. Amat sylvas minores montosas, gregibus parvis incedit.

W.

The roe-deer has strong, upright, rugged, and trifurcated horns, from six to eight inches long. The length from nose to tail, is three feet nine inches: the height before, is two feet three inches; behind, two feet seven inches; the length of the tail is only one inch. The weight of a full grown buck

tains, which are covered with lofty trees. The roe-deer, as if inferior in species, contents himself with a humbler residence, and generally dwells among the thick foliage of young brushwood. But, if he is inferior to the stag in dignity, strength, and stature, he is endowed with more gracefulness, vivacity, and courage *. He is superior in gaiety, neatness, and sprightliness. His figure is more elegant and handsome. His eyes are more brilliant and animated. His limbs are more nimble, his movements quicker, and he bounds, seemingly without effort, with equal vigour and agility. His coat, or hair, is always clean, smooth, and glossy. He never wallows in the mire like the stag. He delights in dry and elevated situations, where the air is purest. He is likewise more crafty, conceals himself with greater address, is more difficult to

is near sixty pounds. The hair in summer is very short and smooth. The ends of the hairs are of a deep red colour, and the bottoms of a dark gray. In winter, the hairs are very long, and hoary at the tips, except at the back, where they are often very dark. The legs are slender; and below the first joint of the hind legs there is a tuft of long hair. The rump and under side of the tail are white.—*Penn. Synop. Quadr.* p. 53.

The name of the roe-deer in Greek is Δορκας; in Latin, *Capreolus, Capriolus*; in Italian, *Capriolo*; in Spanish, *Zorlito, Cabronzillo montes*; in Portuguese, *Cabra montes*; in German, *Rehe*; in Swedish, *Ra diur*; in Danish, *Raa diur*; in Scots, *Roe-buck*.

* When the fawns of the roe-deer are attacked, he defends them with courage; and though smaller, he has strength enough to combat a young stag, and put him to flight.—*Nouv. Traité de la Venerie*, p. 178.

trace, and derives superior resources from instinct: for, though he has the misfortune to leave behind him a stronger scent than the stag, which redoubles the ardour and appetite of the dogs, he knows how to withdraw himself from their pursuit, by the rapidity with which he begins his flight, and by his numerous doublings. He delays not his arts of defence till his strength fails him; but as soon as he finds that the first efforts of a rapid chase have been unsuccessful, he repeatedly returns to his former steps; and, after confounding, by these opposite movements, the direction he has taken, after intermixing the present with the past emanations from his body, he rises from the earth by a great bound, and, retiring to a side, he lies down flat on his belly, and, in this immoveable situation, he allows the whole troop of his deceived enemies to pass very near him *.

* Some years ago, one of these animals, after being hunted out of Scotland, through Cumberland, and various parts of the north of England, at last took refuge in the woody recesses bordering upon the banks of the Tyne, between Prudhoe Castle and Wylam. It was repeatedly seen and hunted; but no dogs were equal to its speed: it frequently crossed the river; and, either by swiftness or artifice, eluded all its pursuers. It happened, during the rigour of a severe winter, that, being pursued, it crossed the river upon the ice with some difficulty; and, being much strained by its violent exertions, was taken alive. It was kept for some weeks in the house, and was then again turned out; but all its cunning and activity were gone; it seemed to have forgotten the places of its former retreat; and after running some time, it laid down in the midst of a brook, where it was killed by the dogs.—*Bewick's Quadr.* p. 134. *W.*

The roe-deer differs from the stag and fallow-deer in disposition, temperament, manners, and almost every natural habit. Instead of associating in herds, they live in separate families. The father, mother, and young, go together, and never mix with strangers. They are constant in their amours, and never unfaithful like the stag. As the females generally produce two fawns, the one male and the other female, these young animals, brought up and nourished together, acquire a mutual affection so strong, that they never quit each other, unless one of them meets with a misfortune, which never ought to separate lovers. This attachment is more than love; for, though always together, they feel the ardour of the rut but once a year, and it continues only fifteen days, commencing at the end of October, and ending before the fifteenth day of November. They are not then, like the stag, overloaded with fat: they have no strong smell, no fury, in a word, nothing that can change the state of their bodies. During this period, they indeed suffer not their fawns to remain with them. The father drives them off, as if he meant to oblige them to yield their place to those which are to succeed, and to form new families for themselves. However, after the rutting season is past, the fawns return to their mother, and remain with her some time; after which they separate for ever, and remove to a distance from the place which gave them birth.

The female goes with young five months and a half, and brings forth about the end of April

or beginning of May. The hinds, as formerly remarked, go with young above eight months; and this difference alone is sufficient to prove, that these animals are so remote from each other in species, as to prevent their ever intermixing or producing an intermediate race. By this difference, as well as those of figure and size, they approach the goat as much as they recede from the stag; for the goat goes with young nearly the same time, and the roe-deer may be regarded as a wild goat, which, feeding solely on wood, carries *wood* instead of horns *. The female, when about to bring forth, separates from the male. To avoid the wolf, who is her most dangerous enemy, she conceals herself in the deepest recesses of the forest. In ten or twelve days, the fawns acquire strength sufficient to enable them to follow her. When threatened with danger, she hides them in a close thicket, and, to preserve them, presents herself to be chased. But, notwithstanding all her care and anxiety, the young are sometimes carried off by men, dogs, or wolves. This is indeed the time of their greatest destruction. Of this species, which is not very numerous, I know, from experience, that more are destroyed in the month of May, than during all the rest of the year. I often live in a

* As the reader may possibly suppose that this absurd notion of Buffon's respecting the quality of deers' horns, exists only in the translation, I shall give the original passage. *Car la chèvre porte à peu près le même tems, et le chevreuil peut être regardé comme un chèvre sauvage, qui, ne vivant que de bois, porte de bois au lieu de cornes.* W.

part of the country * where roe-deer are greatly esteemed †. Many fawns are annually brought me alive by men, and others killed by dogs, without reckoning those which are destroyed by wolves: and I have observed, during the space of more than twenty-five years, that, as if there were a perfect equilibrium between the causes of destruction and renovation, their number is always nearly equal in the same districts. It is not difficult to count them; for they are no where numerous, and they live separately in distinct families: in a coppice, for example, of 100 acres, there will be one family, or from three to five individuals; for a female, which generally produces two fawns, sometimes brings forth but one, and sometimes, though very seldom, three. In another district, of double the extent, there will be seven or eight, that is, two families; and I have remarked, that each district always harbours an equal number, except when the winters have been extremely rigorous and long: in this case the whole family are destroyed; but it is replaced by another the following year; and those districts, for which they have a predilection, are always inhabited nearly by an equal number. It is alleged, however, that, in general, their number is diminishing. There are

* At Montbard, in Burgundy.

† The reciprocal attentions which passed between the king and the philosopher, ought not to be omitted. Every year Buffon sent Louis the Fifteenth a roe-buck from the wood of Montbard; and, in return, as regularly received from his majesty a fine pasty. *W.*

whole provinces, it must be acknowledged, of France, where not one of them is to be found. Though common in Scotland *, there are none in England. They are very rare in Italy; and they are now more scarce in Sweden than formerly, &c. But this effect may have proceeded from the diminution of forests, or from some very severe winter, like that of the year 1709, which almost destroyed the whole roe-deer of Burgundy; so that several years passed before the species was recruited. Besides, they are not equally fond of every country; for, in the same countries, they prefer particular places. They love hills, or plains on the tops of mountains. They never stay in the deepest recesses of the forests, nor in the middle of extensive woods; but give the preference to the skirts or projections of woods which are surrounded with cultivated fields, and to open coppices which produce the berry-bearing alder, brambles, &c.

The fawns continue with their parents eight or nine months, and, when separated, about the end of the first year of their age, their horns begin to appear in the form of two knobs much less than those of the stag. There is still a greater difference between these two animals: the horns of the stag shed in the spring, and are renewed in summer; but those of the roe-deer fall off at the end of autumn, and are replaced

* They are not very common in Scotland; for they exist nowhere but in what is called the *highlands*, or northern mountains of Scotland.

in winter. Several causes concur in producing these different effects. In summer, the stag takes a great deal of nourishment, and grows exceedingly fat; he next exhausts himself so much in the rutting season, that the whole winter is necessary to recover his vigour. But, during this season, instead of superabundant nourishment, he is half starved for want of subsistence, and, consequently, his horns cannot begin to shoot till the spring, when his nourishment begins to be redundant. The roe-deer, on the contrary, who is never so much wasted, has no occasion for equal reparation; and, as he is never loaded with fat, as no change is produced in him by rutting, but continues always nearly the same, he has at all times a redundance of nourishment; so that, even in winter, and a short time after rutting, he sheds and renews his horns. Thus, in all these animals, the redundant organic nourishment, before it is determined to the seminal reservoirs, and forms the seminal fluid, is transferred to the head, and manifests itself externally by the production of horns; in the same manner as, in man, the hair and the beard announce and precede the secretion of the seminal fluid: and it is apparent, that these vegetable productions, as they may be denominated, are formed of a redundant organic substance, but still imperfect, and mixed with brute particles, since they preserve, in their growth and substance, the qualities of vegetables. But the seminal fluid, the production of which is not so early, is a matter

purely organic, deprived entirely of its brute particles, and perfectly assimilated to the body of the animal.

When the roe-deer has renewed his horns, he rubs them against the trees, like the stag, in order to tear off the skin with which they are covered; and this commonly happens in the month of March, before the trees begin to shoot. Hence it is not the sap of the wood which colours the horns of the roe-deer. However, the horns are brown when the animal is brown, and yellow when he is red; and, consequently, the colour of the horns proceeds, as formerly remarked *, solely from the nature of the animal and the impression of the air. The second horns of the roe have two or three antlers in each side; the third, three or four; the fourth, four or five, and they seldom have more. We distinguish the old ones by the thickness of the stems, the largeness of the burr, of the pearlings, &c. As long as the horns continue soft, they are extremely sensible: of this I have had a striking example: the young shoot of a roe-buck's horn was cut off with a ball. The animal was stunned, and fell down as if he had been dead. The shooter, who was near, seized him by the foot; but the buck, suddenly recovering his senses and his strength, dragged the man, though he was strong and alert, thirty paces into the wood. After killing him with a knife, we discovered that he had received no other wound. Besides, it is well known, that

* See the history of the Stag.

flies are very troublesome to the stag: when his horns are growing, he retires to the deepest parts of the wood, where the flies are less numerous; because, when they fix upon the tender horns, the irritation they occasion is insupportable. Thus there is an intimate communication between the soft parts of the horns and the whole nervous system of the animal. The roe-buck, who has nothing to apprehend from the flies, because he renews his horns in winter, never retires in this manner; but he walks with caution, and carries his head low, lest he should touch the branches.

In the stag, the fallow-deer, and roe-buck, the frontal bone has two processes, or eminences, on which the horns rest. These processes begin to shoot at the age of five or six months, soon after acquire their full growth, and, instead of rising higher in proportion as the animal advances in years, they annually sink and diminish; so that, in old stags or roe-bucks, the burs are nearly supported upon the frontal bone, the processes of which having then become very broad and very short. This is the most certain mark by which the age of these animals can be distinguished. At first sight, this fact appears to be singular, but admits of an easy explanation, when it is considered, that the horns, supported by these processes, press against them during the whole time of growth, which continues for several months every year: hence these bones, however hard, must become broader, and sink lower, annually, by the great and long continued pressure they

receive from every renewal of the animal's horns. It is for the same reason, that, though the stems and burrs, or rings, always grow thicker in proportion to the age of the animal, the height of the horns and the number of antlers diminish so fast, that, when he is very old, they are only two thick knobs, with very small antlers.

As the female roe goes with young five months and a half only, and as the growth of the fawn is more rapid than that of the stag, the duration of her life is much shorter, seldom extending, I imagine, beyond twelve or fifteen years. I have reared several of them; but could never preserve them above five or six years. They are very delicate in the choice of their food, require a great deal of exercise, fine air, and much room, which is the reason why they are unable, except in the first years of their growth, to resist the inconveniences of a domestic life. To make a male live comfortably, he must be furnished with a female and a park of a hundred acres. They may be tamed, but can never be rendered obedient or familiar. They always retain a portion of their natural wildness, are easily terrified, and then run with such force and precipitation against the walls, that they often break their limbs. However tame they may be, they cannot be trusted; for the males, particularly, are subject to dangerous caprices; they take an aversion to certain persons, and make furious attacks with their horns, the blows of which are sufficient to knock a man to the ground, after which they continue to tread on him with their

feet. The roe-buck bellows not so frequently, nor with so loud or so strong a voice, as the stag. The young ones utter a short and plaintive cry, *mi*. . . *mi*, by which they indicate their want of food. This sound is easily imitated; and the mother, deceived by the *call*, will come up to the very muzzle of the hunter's gun.

In winter, the roe-bucks frequent the thickest coppices, and feed upon brambles, broom, heath, the catkins of the hazel, willow, &c. In spring, they repair to the more open brushwood, and eat the buds and young leaves of almost every tree. This warm food ferments in their stomachs, and intoxicates them to such a degree, that they are easily surprised. They know not where they are going, and not unfrequently come out of the wood, and sometimes approach flocks of cattle, and the habitations of men. In summer, they dwell in the more elevated coppices, from which they seldom depart, except in very dry weather, when they go to drink at some fountain; for, when the dews abound, or the leaves are moistened with rain, they never drink. They are delicate in the choice of their food; they eat not with avidity, like the stag, and they seldom approach the cultivated fields, because they prefer the berry-bearing alder and bramble, to grain or pot-herbs of any kind.

Though the flesh of these animals be excellent food, yet it admits of much choice. The quality of their venison depends chiefly on the country they inhabit; and even the best countries produce good and bad kinds. The flesh of the

brown roe-buck is finer than that of the red. All the males, after the age of two years, have hard and ill-tasted flesh; but that of the females, though farther advanced in years, is more tender. The flesh of the fawns, when very young, is loose and soft; but at the age of eighteen months, it is in its highest state of perfection. Those which live in plains and valleys are not good; those that come from moist countries are still worse; those brought up in parks are insipid; and, lastly, there are no good roe-bucks but those who inhabit dry and elevated countries, interspersed with hills, woods, cultivated and fallow lands, where they enjoy plenty of air, food, freedom, and solitude; for those which have been often disturbed are meagre, and the flesh of those that have been frequently hunted is dry and insipid.

This species, which is less numerous than that of the stag, and very rare in many parts of Europe, seems to be much more abundant in America, where there are two varieties, the red, which is the largest, and the brown, which has a white spot behind, and is smaller: and, as they are found in the northern, as well as the southern parts of America, it is probable that they differ more from each other than from those of Europe. They are very common, for example, in Louisiana*,

* The flesh of the roe-buck is much used in Louisiana. This animal is somewhat larger than the European kind, and his horns are similar to those of the stag; but he differs both in the coat and the colour. He serves the inhabitants in place of mutton.—*Mem. sur la Louisiaine, par M. Dumont*, tom. i. p. 75.

and larger than those of France. They are likewise found in Brazil; for the animal called *Cujuacu-apara*, differs not more from our roe-buck than the stag of Canada from our stag. There is, indeed, a little variation in the figure of the horns, as appears from Perrault's figure of the Canadian stag, compared with the description and figure of the Brazilian stag, given by Piso. "In Brazil," says Piso, "there are roe-bucks, of which some have no horns, and are called *Cujuacu-été*, and others have horns, and are called *Cujuacu-apara*. The latter are smaller than the former; their hair is smooth, glossy, and mixed with brown and white, especially when the animals are young; for the white is effaced with age. The foot is divided into two black toes, upon each of which there is a smaller one superinduced; the tail is short; the eyes large and black; the nostrils open; the horns are of a middle size, and fall off annually. The female goes with young five or six months. They may be tamed *," &c. Margraave adds, "that the horns of the *apara* have three branches, and that the inferior branch is longest, and divided into two." From these descriptions, it is apparent, that the *apara* is only a variety of our roe-buck; and Ray suspects †, that the *Cujuaca-apara* is the male, and the *Cujuaca-été* the female, and that they both belong to the same species. I should willingly assent to Mr. Ray's

* Pison. Hist. Brazil. p. 98.

† Raii Synops. Anim. Quad. p. 90.

opinion, if Piso had not expressly said, that those which have horns are smaller than the other kind. It is not probable that, at Brazil, the females of this species should be larger than the males, since every where else they are smaller. At the same time, though I believe the *Cujuaca-apara* to be only a variety of our roe-buck, to which we may also add the *Capreolus marinus* of Johnston, I shall not decide concerning the *Cujuaca-été* till farther information be obtained.

Roe-bucks, similar to those of Europe, are found throughout all North America; only they are larger, and their size increases in proportion as the climate becomes more temperate *.

* Roe-deer are very common in Canada, and in the forests of South Florida: they wander about in large herds, and enjoy their vast solitudes in peace, except when they are interrupted by the hunters. Each herd is conducted by a male, of a much larger size than the rest, and apparently of great age.

We learn from Pallas, that vast numbers of these animals inhabit the heaths of a district which bounds the Samara (a river to the east of the Volga, in Tartary), and that the Cossacks kill a great many every year. The month of March is chosen for the chase, when the sun, having acquired some power, melts the surface of the snow, which freezes again in the night, and forms a superficial crust, hard enough to bear the hunters in their snow shoes. The deer, in running, break through this crust with their hoofs, which greatly retards their flight, and leaving a tract behind them, discovers their route. When the hunters have traced their steps, they drive them into the valleys, where the wind sometimes drifts the snow to the depth of five or six feet. The dogs, which are too light to penetrate the thin crust of ice, stop the deer while they

The roe-bucks of Louisiana are generally double the size of those of France *. M. de Fontenelle adds, that they are easily tamed. In this he is supported by the evidence of M. Kalm, who mentions a roe-buck which went daily to the wood in quest of food, and returned to his house in the evening †. But, in South America, this species is subject to great varieties. M. de la Borde, king's physician at Cayenne, says, " that they have there four kinds of stags, called indiscriminately, both males and females, by the name of *hinds*. The first kind, called *wood* or *red hinds*, keep perpetually in the thickest parts of the forest, to avoid being tormented by the flies. This kind is taller and thicker than that called the *savanna hind*, and yet it is exceeded in size by the *barallou hind*, which is the second species, and of the same colour with the wood hind. When the males are old, their horns consist of one branch only, and they at no period exceed four or five inches in height. These barallou hinds are rare, and combat the wood hinds. In these two species, at the side of each nostril, there are two considerable glands, which secrete a white fetid humour,

struggle in the snows, till the Cossacks are able to come up, and kill them with their lances.

In the environs of Krasnoiark, in Siberia, according to Pallas, roe-deer are so numerous, that they are sold for fifteen copecs (about sevenpence) a-piece. *W.*

* Extract of a letter from M. de Fontenelle, king's physician at New Orleans, to M. de Buffon.

† Voyage de Pierre Kalm, tom. ii. p. 350.

"The third species is called the *savanna hind*. Its coat is grayish, and its limbs and body longer than the preceding. M. de la Borde was assured by the hunters, that the savanna hind, had no glands on the nostrils, and that it was less savage, and even so curious as to approach men.

"The fourth species is the savanna hind, which is smaller and more common than the other three. They are not so wild, and their horns are longer and more palmated or branched than those of the other three kinds. They are called *savanna hinds*, because they frequent the watery savannas, and lands covered with marshes.

"These animals feed upon the manioc, and often destroy the plantations. Their flesh is very tender and well-tasted. Both the old and the young are used as food, and they are superior to the European stags. They tame so easily, that they run about the streets of Cayenne, and go out of the town and return, without being afraid of any object. The females even go into the woods in quest of wild males, and afterwards return with their fawns.

"The caricou is the smallest; his hair is of a whitish gray colour, and his horns are straight and pointed. He belongs rather to the roe-buck than to the stag. He never appears near inhabited places; but is very common in large woods. However, he is easily tamed; and the female brings forth only one fawn every year."

If the above descriptions be compared with

what is afterwards remarked in the history of the *Mazame*, or Mexican deer, it will appear, that all these pretended species of stags or hinds are only roe-bucks, the varieties of which are more numerous in the New than in the Old Continent.

It has frequently been mentioned, in my original work, that the common colours of wild animals are yellow, brown, and gray, and that the domestic state gives rise to white fallow-deer, white rabbits, &c. I find, however, that Nature alone sometimes produces the same effect upon wild animals. M. l'Abbé de la Villette informs me, that a man, belonging to his brother's estate, near Orgelet, in Franche-compté, brought him two old roe-deers, one of which was the common colour, and the other, being a female, was as white as milk, and had no black, but on the hoofs and the extremity of the nose*.

I have mentioned only two races of roe-deer; one tawny, or rather russet, larger than the second, the coat of which is of a brown, more or less deep: but M. Mellin has acquainted me with a third race, the coat of which is absolutely black.

" In speaking of the colour of the roe-deer," writes this illustrious observer to me, " you do not notice the *quite black*, although you mention an entirely white fawn. This induces me to believe that a fixed variety of the roe-deer, totally

* Extract of a letter from M. l'Abbé de la Villette à M. de Buffon, dated Lon-le-Saumier, June 17, 1773.

black, is perhaps unknown to you: it exists, however, in a very small district of Germany, and nowhere else. It is in a forest named *la Lucie*, province of Dannenberg, belonging to the king of England as duke of Luneberg, that these roe-deer are found. I wrote to the grand master of the forests of Dannenberg, to have these roe-deer in my park, and the following is his answer: 'The black roe-deer are absolutely of the same size, and have the same qualities, as the tawny, or the brown: however, it is a constant variety, and I believe that it is the buck, and not the doe, that gives the colour to the fawn (I have made the same observation on the fallow-deer); for I have seen black ones which had tawny fawns. I observed that, in 1781, a black doe had two fawns, one yellow and the other black; a tawny doe had two black fawns; another tawny doe had one black fawn; and two black does, to make amends, had two tawny fawns. There are some that are only blackish, but the majority are as black as coal. Among others there is a roe-deer, the most beautiful of its species, with a coat as black as Indian ink, and antlers of a yellow colour. Finally, I have made many attempts to raise them, but without success; they all died; while the tawny fawns, which they produced, have all succeeded well. From whence I conclude, that the black roe-deer is of a more delicate habit than the tawny. . . . . What can be the cause of so constant and yet so diffused a variety?'"

THE INDIAN ROE-DEER *.

WE have here given the figure of an Indian animal, which appears to be very nearly allied to our European roe-deer, but which nevertheless differs by a character sufficiently strong, to prevent it being considered as forming a mere variety of our species: this character consists in the structure of the superior bone of the head, on which are supported the *burrs* that bear the horns of the deer. I am indebted for the knowledge of this animal to the learned professor M. Allamand; and I cannot do better than to add his description, as it is pub-

* CHARACTER SPECIFICUS.

CERVUS MUNTJAC. C. cornibus teretibus pilosis retroversis trifurcis; apice superiore uncinato.—*Linn. Syst. Nat. Gmel.* i. p. 180.—*Schreb.* v. t. 254.

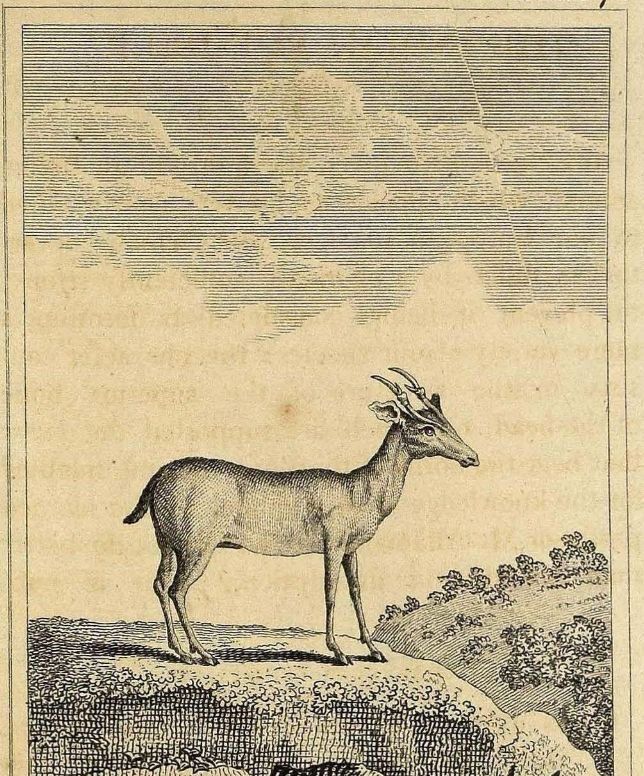
LE CHEVREUIL des INDES.—*Buff. Hist. Nat. par Sonn.* xxiv. p. 184, pl. 8.

RIB-FACED DEER.—*Penn. Hist. Quadr.* i. p. 119. No. 60.—*Shaw's Gen. Zool.* ii. p. 301.

HABITAT

per exiguas greges in insulis Java et Zeylon.

Plate 74



INDIAN ROE-DEER.

lished in the new supplement to my work on quadrupeds.

"We have seen in the preceding articles, that Africa contains a great number of animals which have never been described: this is not astonishing; since the interior of this vast part of the world is almost entirely unknown to us. We have more reason to be surprised that Asia, inhabited in general by a more polished people, and very frequently by Europeans themselves, should often furnish what escapes the observation of the traveller: of this we have an example in the pretty animal, which is represented in the plate.

"It was sent from Bengal, in 1778, to the late M. Vanderstel, commissary of the city of Amsterdam; it came to him in very good condition, and lived for some time: ignorant of the name by which it is known in its native country, I have called it the roe-deer, on account of its resemblance to that animal in its horns and general figure, though it is of a much smaller size. In point of size, it would agree better with the musk, but the horns of such musks as have any, are hollow, and not solid, like those of the animal under our present consideration; which, consequently, forms an essential characteristic difference. It has more traits of resemblance to the stag, but it forms too great a contrast in size to allow of giving it the same name; the animal hardly being two feet seven inches long, and not more than eighteen inches high.

"The short hair with which its body is co-

vered, is white from the root to half its length; the extremity is brown, making by its mixture a gray, nevertheless the brown predominates, chiefly on the back, and in a less degree under the belly; the inside of the thighs, and below the neck, are whitish; the hoofs are black, and marked at top with a small white spot; the nails are hardly visible.

"The head, like that of most cloven-footed animals, is furnished with two horns, which exhibit some remarkable singularities: they have a common origin at the distance of two inches from the end of the muzzle; where they begin to separate from each other, making an angle of about forty degrees, under the skin, which they raise in a very sensible manner: at length, they ascend in a straight line along the sides of the head, still covered with skin, but so as to be readily traced by the eye, or discovered by the touch: for they form a ridge on the bone, to which they adhere, of a finger's breadth in height. When they reach the top of the head, they take another direction, rising perpendicular above the frontal bone to the height of three inches, covered by the skin which surrounds them on all sides. At this point the skin terminates, and they are surmounted by what is called the *burr* in stags. The horns continue to rise from the middle of the *burrs*, but unequally; the left horn rises to the height of three inches, and is bent back at the end, and terminates in a point; almost immediately above the *burr* it sends forward an antler, about half an inch long;

the right horn, which is about two inches and a half in length, pushes forth an antler still shorter than the other, and directed backwards. The figure, which was taken from the living animal, is a good representation of these particulars. The horns, which are without bark, are shining and of a white colour, with a faint tendency to yellow. They are not curled, and are therefore without grooves.

"The age of this animal (which did not live long in France) is not known. I am also ignorant whether it would have shed its horns like the roe-deer, or whether those it had were young, and would have grown larger and more branched, as it increased in age.

"If we consider, as a portion of horn, the part which originates near the muzzle, which extends under the skin of the face, and which remains covered to the *burr;* we can scarcely doubt that this part of the horn is permanent; and, if so, this animal, like the giraffe, exhibits a very remarkable irregularity in the class of animals that have solid horns.

"But it is known that the horns of stags, of fallow-deer, and of roes, rest on two eminences of the frontal bone. In our Indian roe, these eminences are raised much higher, forming tuberosities which are prolonged between the eyes to the muzzle, and, if they do not form part of the same body, they are, at least, so strongly attached to the bones of the nose, that I found it impossible to succeed in passing a point through the skin between them. As the hide of

the animal did not belong to me, I regret the want of permission to satisfy myself of this particular, by raising the skin which covered the bone; however, it may shed its horns with as much ease as the stag, since the *burrs*, situated on the top of the eminences, are not more strongly attached to their points of support, than in other animals that annually cast their horns. Thus I am very much inclined to think that they are cast also; but of this I am certain, that this singular conformation forms a distinct species in the class of *ruminans* (ruminating animals), and not a simple variety, like the *cuguacu-apara*, of Brazil, which is nearly of the same size.

"In the middle of the forehead, between the two prolonged ridges already mentioned, there is a soft, plaited, and elastic skin, in the folds of which may be observed a glandulous substance, from whence exudes an odorous matter.

"The animal has eight cutting teeth in the lower jaw, and six grinders on each side in both jaws. There are two tusks in the upper jaw, the same as in the stag, which are wanting in the European roe-deer; these tusks project a little outwards, and make a slight impression on the lower lip.

"It has two fine bright eyes; below them are situated two *larmiers* *, as in the stag, which

* The *larmiers*, are two slits situated under the eyes in the stag, from whence a yellow humour distils in drops, that is called stags' tears. There is something extraordinary in these vents. They did not escape the observation of the late Mr. White, of Selborne, who tells us, that they have a

are very remarkable for their size and depth. The absence of these *larmiers*, and the tusks, in the roe-deer, caused me to assert, that it has more traits of resemblance with the stag, than with this last animal.

" It has a very long tongue, which serves not only to clean the *larmiers* but also the eyes, and sometimes is even pushed beyond them.

" The ears, which are three inches long, are placed at the distance of half an inch from the lower part of the eminences that support the horns: the tail is very short, rather thick, and white beneath.

" This animal has a figure as graceful and elegant as our common roe-deer: it appears even to be more sprightly and active. Although it

communication with the nose, and open, one at the corner of each eye. They are of singular service to the animal when he drinks, as it is his custom to plunge his nose deep into the water, and continue in that situation a considerable time. During the draught, he breathes through the vents, which he can open at pleasure, and thus indulge himself without inconvenience. It is Mr. White's opinion, that this curious formation of the head may be of great service to beasts of chase, by affording them free respiration; and no doubt these additional nostrils are thrown open when they are hard run.

This peculiarity is not confined to the deer alone; for Pennant was surprised to find something analogous in the conformation of the antelope, which he remarks as having a long slit beneath each eye, that the animal can open and shut at pleasure. He held an orange to one, and found that the creature made the same use of these orifices as of his nostrils; applying them to the fruit, and seeming to smell it through them. *W.*

dislikes to be touched by strangers, it nevertheless takes what is presented to it, and eats bread, carrots, and all sorts of herbs. It was placed in a park, together with a female axis, where it became in season in the month of March and April, and plagued its companion exceedingly, by its repeated attempts to cover her, but from its small size it could not succeed. It died in the year 1779.

84A

Plate 75

HARE

THE HARE*.

THE most numerous species of animals are by no means the most useful. Nothing can be more noxious than those multitudes of rats, mice,

* LEPUS.

CHARACTER GENERICUS.

Dentes primores utrinque duo; superiores duplicati, interioribus minoribus.

Laniarii nulli.

CHARACTER SPECIFICUS.

Lepus Timidus. L. cauda abbreviata, auriculis apice nigris, capite longioribus.—*Linn. Syst. Nat. Gmel.* i. p. 160.

Lepus cauda abbreviata, pedibus posticis longitudine corporis dimidii, auriculis apice nigris.—*Erxleb. Mamm.* p. 325.

Lepus caudatus ex cinereo rufus.—*Briss. Regn. An.* p. 94.

Lepus vulgaris, cinereus, cujus venatio animum exhilarat.—*Klein. Quadr.* p. 51.

Lepus.—*Gesn. Quadr.* p. 69.—*Aldrov.* p. 247.—*Jonst. Quadr.* t. 65.—*Ray's Quadr.* p. 204.

Le Lievre.—*Buff. Hist. Nat. par Sonn.* xxiv. p. 194. pl. 9.

Hare.—*Penn. Hist. Quadr.* ii. p. 98.—*Brit. Zool.* i. No. 20.—*Bew. Quadr.* 337.—*Shaw's Gen. Zool.* ii. p. 197, pl. 162.

HABITAT

ubique in Europa, perque totam fere Asiam, in Ceylona,

locusts, caterpillars, and other insects, the fecundity of which, Nature seems rather to permit than to ordain. But the species of the hare and the rabbit afford to man the double advantage arising from number and utility. The hare is universally diffused over all the climates of the earth. The rabbits, though originally natives of particular climates, multiply so prodigiously wherever they are transported, that, instead of being rooted out, much art is necessary to diminish their number, which is sometimes incommodious.

When we reflect on the amazing fecundity of each species, the rapid and prodigious multiplication of particular animals, which come forth in myriads to ravage the earth, we are astonished that they oppress not Nature by their

Ægypto, Barbaria, America boreali ubi minor et sola varietas alpina reperitur, nisi forte propria species sit.

W.

The ears are tipt with black; the eyes are large and prominent; the chin and whiskers white; the hair on the face, back, and sides, white at the bottom, black in the middle, and tipt with tawny red. The throat and breast are red, the belly white, and the tail black above, and white beneath. The feet are covered with hair, even at the bottom. A large hare weighs eight pounds and a half; its length, from the nose to the tail, is two feet.—*Pennant's Synops. of Quadr.* p. 248.

In Greek, Δαχως; in Latin, *Lepus*, quasi *Levipes;* in Italian, *Lepre;* in Spanish, *Leibre;* in Portuguese, *Lebre;* in German, *Hase;* in Swedish, *Hare;* in Dutch, *Hase;* in Polish, *Sajanz;* in Russ, *Zaitza;* in Arabian *Ernab, Hurneb, Arneph;* in Turkish, *Tausan;* in Persic, *Kargos;* at Brazil, *Thabiti;* in North America, *Soutanda.*

numbers, and, after desolating her productions, fall victims to the universal waste they have created.

We view with terror the approach of those thick clouds, those winged armies of famished insects, which seem to threaten the whole globe with destruction, and, lighting on the fruitful plains of Egypt, or of India, annihilate in an instant, the labours and the hopes of nations; and, sparing neither grain, nor fruits, nor herbs, nor leaves, nor roots, rob the earth of its verdure, and convert the richest countries into deserts. We behold, descending from the mountains of the north, innumerable multitudes of rats, which, like an animated deluge, overwhelm the plains, spread over the southern provinces, and, after destroying, in their passage, every thing that lives or vegetates, finish their noxious course, by infecting the earth and the air with the putrid emanations of their dead carcasses. In the southern regions, we behold issuing suddenly from the deserts, myriads of ants, which, like an inexhaustible torrent, press forward in continued columns, drive men and animals from their habitations, and never retire till they have produced an universal devastation: and, when men, like the animals, were half savage, and subject to all the laws and excesses of Nature, have not similar inundations of the human species taken place? Have not Normans, Huns, Goths, whole nations, or rather colonies, of fierce and brutal people, without habitation or name, suddenly issued from their caverns, and, with no

other power but what arises from number, overturned cities and empires, and, after laying waste the earth, repeopled it with men equally new and barbarous as themselves?

These great events, these remarkable æras in the history of the human race, are, however, only slight vicissitudes in the ordinary course of animated Nature, which, in general, is always the same: its movements are performed on two steady pivots, unlimited fecundity, and those innumerable causes of destruction which reduce the product of this fecundity to a determined measure, and preserve at all periods nearly an equal number of individuals in each species. And, as those enormous multitudes of animals, which sometimes suddenly appear, vanish without augmenting the common stock, that of the human species, in like manner, continues always the same. The variations of the latter are only slower; because, the life of man being longer than that of small animals, more time is necessary to bring about the alternate changes of augmentation and diminution. But even this time, though it makes a deep impression, because it has been accompanied with horror and desolation, is only an instant in the succession of ages: for, in estimating the whole human species that ever existed, the number of men, like that of all other animals, ought, at all periods, to be nearly the same, since it depends upon the equilibrium of physical causes; and this equilibrium, to which every thing has been long reduced, cannot be infringed either by the efforts of men, or by any

moral circumstances, which are only particular effects of those physical causes. Whatever care man may bestow on his own species, he will never render it more numerous in one place, but at the expense of an equal diminution in another. When any portion of the earth is over stocked with men, they disperse or destroy each other, and often establish such laws and customs as give too great a check to this excess of multiplication. In remarkably prolific climates, as in China, Egypt, and Guinea, the inhabitants banish, mutilate, sell, or drown their offspring: in France, and other Catholic countries, they are condemned to perpetual celibacy. Those who exist, usurp easily the rights of those who have no existence; regarding themselves as necessary beings, they annihilate those which are contingent, and, for their own convenience, suppress future generations. The same restrictions are laid upon man, without his perceiving it, as are imposed upon the other animals; we cherish or multiply, neglect or destroy our species, according to the advantages or inconveniences which result from them: and, as all moral effects depend upon physical causes, which, ever since the earth acquired its consistence, are fixed and permanent, the number of the human species, as well as that of all other animals, must likewise be constant and unalterable. Besides, this fixed state, this constant number, imply not absolute quantities. All physical and moral causes, and the effects that result from them, are balanced, and comprehended within certain limits, which are more or

less extended, but never to such a degree as to destroy the equilibrium. As the whole universe is in perpetual motion, as all the powers of matter mutually act upon and counterbalance each other, every effect is produced by a kind of oscillations, to the middle points of which we refer the ordinary course of Nature, and the extremes are those effects which are farthest removed from that course. Hence we find, that, both in animals and vegetables, an excessive multiplication is commonly followed by sterility: plenty and scarcity alternately succeed each other, and often so quickly, that a tolerable judgment may be formed of the produce of one year by that of the preceding year. Apple, plumb, oak, beech, and most fruit and forest trees, produce abundantly but once every other season. When caterpillars, flies, field mice, and other animals multiply to excess in one year, their number is greatly diminished the following year. If insects, during these fertile seasons, multiplied the next in proportion to their numbers, the whole fruits of the earth, all our domestic animals, and even man himself, would fall victims to their rapacity. But the causes of destruction and sterility immediately succeed those which give rise to a redundant multiplication. Neither is this destruction occasioned by contagion: it is a necessary consequence of too great a mass of animated matter collected in one place. In every species there are particular causes of death, as shall afterwards be shown, which are sufficient to compensate the excess of preceding generations.

I must again remark, that this reasoning is not to be understood in an absolute or even in a strict sense, especially with regard to those species which are not left entirely to the guidance of Nature. Man, and the other animals he has taken under his protection and care, are more abundant than they would be without that attention he bestows on them. But, as this care has also its limits, the augmentation which results from it has long been confined by immutable boundaries. And though, in civilized countries, the human species, as well as domestic animals, are more numerous than in other climates, they never multiply to excess; because, whenever they become incommodious, their number is diminished by the same power that produced them.

In districts appropriated to the pleasures of the chase, four or five hundred hares are sometimes killed in the course of a single day's sport. The multiplication of these animals is very rapid. From the first year of their existence, they are always in a condition for propagating. The females go with young only thirty or thirty-one days. They bring forth three or four at a litter, and, immediately afterwards, they receive the male. They likewise admit him during the time of gestation, and, from a peculiar conformation of their organs, they have frequent superfœtations *: for the uterus is only a continua-

* Pennant justly observes, that, as the hare breeds very frequently in the course of a year, there is no necessity for having recourse to superfœtation to account for their numbers. This idea, however, did not originate with Buffon,

tion of the vagina, and has neither neck nor orifice, as in other animals; but, in each horn, there is an orifice opening into the vagina, which dilates during the time of bringing forth. Thus the horns are two distinct uteri, which can act independent of each other; so that the females of this species are capable of conceiving and bringing forth, at different times, by each uterus; and, consequently, superfœtations must be as frequent among these animals as they are rare in those which have not a double organ.

It is apparent, therefore, that the female hares may be in season and impregnated at all times. Another singularity in their structure proves them to be equally lascivious as they are fertile. The glans of the clitoris is prominent,

since Herodotus noticed the same circumstance *. Speaking of the fecundity of those animals which are useful to mankind, compared to those that are obnoxious to him, he says; "the hare, for instance, the prey of every beast and bird, as well as of man, produces young abundantly. It is the singular property of this animal, that it conceives a second time, when it is already pregnant, and, at the same time, carries in its womb young ones covered with down, others not yet formed, others just beginning to be formed, whilst the mother herself is again ready to conceive."

Pliny probably imbibed the same opinion from Herodotus, as we find the following passage in his Natural History: "Lepus omnium prædæ nascens, solus præter Dasypodem superfœtat, aliud educans, aliud in utero pilis vestitum, aliud implume, aliud inchoatum gerens pariter."

W.

* Lib. iii. c. 108.

and nearly as large as that of the male penis; and, as the vulva is hardly visible, and the male, when young, has neither scrotum nor testicles on the outside of the body, it is often difficult to distinguish the females from the males. This peculiarity of structure has given rise to the following notions: that hermaphrodite hares are very common; that the males sometimes bring forth young; and that some are alternately males and females, and perform the functions of either sex, because the females, being more ardent than the males, often mount upon them, and because the external resemblance is so great, that, unless narrowly examined, the one may easily be mistaken for the other.

The young, when brought forth, have their eyes open. The mother suckles them about twenty days; after which they separate, and procure their own food. They never remove far from each other, nor from the place where they are littered. They live, however, in solitude, each making a form or seat at the distance of sixty or eighty paces. Thus, when we meet with one young hare, we are almost certain of finding two or three others in the neighbourhood. They feed more in the night than in the day; they eat herbs, roots, leaves, fruit, grain, and prefer those plants which have milky juices. During winter, they gnaw the bark indiscriminately from all trees, except that of the alder and lime, which they never touch. When reared in houses, they are fed with lettuce and pot-

herbs: but the flesh of those fed hares has always a bad taste *.

During the day, they sleep or repose in their forms, and are active only in the night, when they move about, feed, and copulate. When the moon shines, they are seen playing together, leaping, and chasing each other. The smallest motion, or the noise of a falling leaf, is sufficient to terrify and make them fly different ways.

Some authors maintain, that hares chew the cud. But I cannot assent to this opinion; because they have one stomach only, and its conformation, as well as that of the other intestines, is totally different from those of ruminating animals. The cæcum of the latter is small, but that of the hare is very large; and, when to the capacity of the stomach this large cæcum is added, it is easy to perceive that the hare, by taking a great quantity of aliment, may live upon herbs alone, like the horse and ass, which have also a

* The late celebrated poet, Mr. Cowper, who kept some hares for his amusement, observed that sand was in great estimation with them, perhaps as a digestive. "It happened," says this gentleman, "that I was cleaning a bird-cage, while the hares were with me; I placed a pot filled with such sand upon the floor, which, being at once directed by a strong instinct, they devoured voraciously: since that time, I have generally taken care to see them well supplied with it. They account green corn a delicacy, both blade and stalk, but the ear they seldom eat: straw of any kind, especially wheat straw, is another of their dainties: they will feed greedily upon oats, but, if furnished with clean straw, never want them." *W.*

large cæcum, and but one stomach, and, consequently, are incapable of ruminating.

Hares sleep much, but always with open eyes. They have neither eyelids nor cilia, and their eyes seem to be bad. But, as a remuneration, they have an acute sense of hearing, and enormous ears in proportion to the size of their bodies. These long ears they move with great facility, and employ them as a rudder to direct their course, which is so rapid, that they outstrip all other animals. As their fore-legs are much shorter than the hind-legs, they run more easily up than down hill; hence, when pursued, they always take to the highest grounds. Their running is a kind of gallop, a succession of quick leaps. Their motion is not accompanied with noise; because their feet are covered, both above and below, with hair. They are perhaps the only animals which have hair in the inside of the mouth.

The duration of their life, like that of other animals, is proportioned to the time of their growth, which is completed in one year, and they live about seven. The males are said to live longer than the females. They pass their days in solitude and silence; and their voice is never heard but when seized or wounded: it is a loud, sharp cry, having some resemblance to the human voice. They are not so savage as their manners and habits would indicate: they are gentle, and susceptible of a kind of education. Though easily tamed, and even rendered caressing, they never acquire that attachment which is

necessary to make them domestic; for, when taken young, and brought up in the house, they take the first opportunity of regaining their liberty, and of flying to the fields *. As they

* Both gratitude and attachment seem to be sufficiently exemplified in this innocent animal, by the account which Mr. Cowper has left us of his tame hares: he paid great attention to his harmless companions, and speaks of one of them in the following words.

" Puss grew presently familiar, would leap into my lap, raise himself upon his hinder feet, and bite the hair from my temples. He would suffer me to take him up, and to carry him about in my arms, and has more than once fallen fast asleep upon my knee. He was ill three days; during which time I nursed him; kept him apart from his fellows, that they might not molest him (for, like many other wild animals, they persecute one of their own species that is sick), and, by constant care, and by trying him with a variety of herbs, restored him to perfect health. No creature could be more grateful than my patient for his recovery; a sentiment which he most significantly expressed by licking my hand, first the back of it, then the palm, then every finger separately, then between all the fingers, as if anxious to leave no part of it unsaluted; a ceremony which he never performed but once again, upon a similar occasion. Finding him extremely tractable, I made it my custom to carry him always after breakfast into the garden, where he hid himself generally under the leaves of a cucumber vine, sleeping or chewing the cud till evening; in the leaves also of that vine he found a favourite repast. I had not long habituated him to this taste of liberty, before he began to be impatient for the return of the time when he might enjoy it. He would invite me to the garden by drumming upon my knee, and by a look of such expression as it was not possible to misinterpret. If this rhetoric did not immediately succeed, he would take the skirt of my coat between his teeth, and pull at it with all his force. Thus puss might be said to be perfectly tamed; the shyness of his nature was done away; and, on the whole, it was visible, by many

have a fine ear, sit spontaneously on their hind-legs, and use the fore-legs as a kind of hands, they have been trained to beat a drum, to perform gestures in cadence, &c.

In general, the hare wants neither instinct sufficient for his own preservation, nor sagacity for escaping his enemies. He forms a seat or nest: in winter he chooses situations exposed to the south, and in summer to the north. With a view to deceive, he conceals himself between clods or hillocks of the same colour with that of his own hair. "I have seen," says Fouilloux, "a hare so sagacious, that, after hearing the hunter's horn, he started from his form, and, though at the distance of a quarter of a league, went to swim in a pool, and lay down on the rushes in the middle of it, without being chased by the dogs. I have seen a hare, after running two hours before the dogs, [illegible] another from his seat, and take possession of it. I have seen others swim over two or three ponds, the narrowest of which was eighty paces broad. I have seen others, after a two hours' chase, run into a sheep-fold, and lie down among the sheep. I have seen others, when hard pushed, run in among a flock of sheep, and would not leave them. I have seen others, after hearing the noise of the hounds, conceal themselves in the earth. I have seen others run up one side of a hedge, and

symptoms, which I have not room to enumerate, that he was happier in human society, than when shut up with his natural companions." *W.*

return by the other, when there was nothing else between them and the dogs. I have seen others, after running half an hour, mount an old wall, six feet high, and clap down in a hole covered with ivy. Lastly, I have seen others swim over a river, of about eighty paces broad, more than twice in a length of 200 paces."

But these facts unquestionably exhibit the greatest efforts of their instinct; for their ordinary resources are not so fine nor so complicated: when pursued, they first run with rapidity, and then double or return upon their former steps. They always run in the direction that the wind blows. The females run not so far from their place of starting as the males; but they double oftener. In general, hares hunted in the place that gave them birth, never remove to a great distance from it, but return to their form; and, if chased two days successively, they perform, in the second day, the same doublings they had observed the day before. When a hare runs straight out, and to a great distance from the place he started, it is a proof that he is a stranger. It often happens, that male hares, especially during the most remarkable period of rutting, which is in the months of January, February, and March, when they have few females near them, perform journeys of several leagues in quest of mates; but, as soon as they are started by the dogs, they fly back to the place of their nativity, and never more return. The females wander not in this manner. Though longer than the males, they are weaker, and less

agile: but they are more timid; for they never allow the dogs to come so near their seats as the males, and their doublings are more frequent. They are also more delicate, and more susceptible of impressions from the weather. They avoid water and dews. But there are males, called *measled hares*, which love marshy and watery grounds. The flesh of these hares is bad tasted; and, in general, the flesh of all hares which inhabit valleys is whitish and insipid; but those of elevated or hilly countries, where the wild thyme, and other savoury herbs abound, are extremely good. It has even been remarked, that those which live in the low, woody grounds of the same country, are not near so good as those that inhabit the ridges of hills, or the cultivated fields and vineyards; and that the flesh of the female is always more delicate than that of the male.

The nature of the soil has a considerable influence on the hare, as well as upon all other animals. The mountain hares are larger than those of the plains, and likewise of a different colour. The former are browner, and have more white under the neck than the latter, which are almost red. In high mountains, and in northern regions, they become white during winter, and resume their usual colour in the summer. Only a few, and perhaps these are very old, continue white; for they all turn more or less white with age. The hares of Italy, Spain, and Barbary, are smaller than those of France and other north-

ern nations. According to Aristotle, they are smaller in Egypt than in Greece.

Hares are equally diffused over all climates. They abound in Sweden, Denmark, Poland, Russia, France, Britain, Germany, Barbary, Egypt, the islands of the Archipelago, and particularly Delos *, which was called *Lagaia* by the ancient Greeks, because of the number of hares which were found there. Lastly, hares are numerous in Lapland †, where they are white for ten months in the year, and resume their proper colour during the two warm months of summer only.

"In Norway," says Pontoppidan, "rabbits are found only in a few places; but hares are very frequent. Their hair, which is brown and gray during summer, becomes white in winter. *Like cats, they take, and eat mice*, and are of a smaller size than those of Denmark ‡."

That hares eat mice, is extremely improbable: but it is not the only marvellous or false fact related by the good bishop of Bergen.

Hence it appears, that every climate is nearly equal to these animals. It has, however, been remarked, that they are less frequent in the east than in Europe, and that they are very rare in South America, though they again make their

* Descript. des Isles de l'Archipel. de Dapper, p. 375.

† Les Œuvres de Regnard, tom. i. p. 180. Il Genio Vagante, tom. ii. p. 46. Voyage de la Martiniere, p. 74.

‡ Pontoppidan's Nat. Hist. of Norway.

appearance in Virginia, Canada *, in the neighbourhood of Hudson's Bay †, and the Straits of Magellan. But these North American hares are perhaps a different species from ours; for travellers inform us, that they are not only much larger, but that their flesh is white, and of a different taste from that of the common kind ‡. They add, that the hair of the North American hares never falls off, and that their skins are excellent furs. In excessively hot countries, as Senegal, Gambia, Guinea §, and particularly in the cantons of Fida, Apam, Agra, and some other regions situated under the Torrid Zone, both in Africa and America, as in New Holland, and the isthmus of Panama, there are animals which have been called *hares* by travellers, but are rather a species of rabbit ‖; for the rabbit is a native of warm climates, and is never found very far to the north; but hares are larger and stronger, in proportion to the coldness of the country they inhabit.

"The hares of the isle of France," remarks M. le Vicomte de Querhoënt, "are not larger than French rabbits. Their flesh is white, and they burrow not in the ground. They are very numerous; their hair is smoother than that of

* La Relation de la Gaspesie, par le P. le Clercq, p. 488, &c.

† Le Voyage de Robert Lade, tom. ii. p. 317.

‡ La Suite des Voyages de Dampier, tom. v. p. 167.

§ L'Hist. Gen. des Voyages, par M. l'Abbe Prevot, tom. iii. p. 235, 296.

‖ Dampier, vol. iv. p. 111. Wafer, tom. iv. p. 224.

our hares; and they have a large black spot on the hind part of the head and neck."

M. Adanson likewise asserts, that the hares of Senegal are not entirely similar to those of France; that they are somewhat less; that their colour is a mixture between that of the hare and the rabbit; and that their flesh is exquisitely delicate *†.

It is universally known, that hares make forms, and burrow not in the ground, like rabbits. But I have been informed by an able naturalist, M. Hettlinger, superintendant of the Pyrennean mines, that, in the mountains in the neighbourhood of Baigory, the hares often make holes in the clefts of rocks, which is not considered as remarkable ‡§.

It is likewise well known, that hares do not willingly inhabit places which are frequented by rabbits; but it also appears, that rabbits do not multiply in countries where hares are numerous.

This animal, though so much in request for

* Voyage au Senegal, par M. Adanson, p. 25.

† Sparrman says, that he met with two hares about the Cape of Good Hope, that resembled our species: but, in another part of his Travels, he speaks of a hare, which he conceives to be different, and which is, in all probability, the Cape hare. *W.*

‡ Letter from M. Hettlinger to M. de Buffon, dated at Baigory, July 16, 1774.

§ The hares between Aleppo and Bassora are in the habit of forming burrows in the ground, and in such abundance, that they resemble an English rabbit-warren. *W.*

the tables of Europeans, is not relished by the oriental nations. The flesh of the hare, it is true, as well as that of the hog, was interdicted by the law of Mahomet, and still more anciently by the Jewish law. But it was much esteemed by the Greeks and Romans: *Inter quadrupedes, gloria prima Lepus* *. It must, indeed, be allowed, that not only the flesh, but the blood of this animal, is excellent. The fat contributes nothing to the delicacy of the flesh; for the hare, in his natural state of perfect liberty, is never fat; but when fed in the house, he often dies merely by the load of fat he acquires.

The hunting of the hare is the amusement, and not unfrequently the sole occupation of the idle: as it requires little apparatus or expense, and is even useful, it is a diversion universally agreeable. In the mornings and evenings, the hunter watches, at the edges of the wood, the going out or returning of the hares. During the day, he searches for them in their forms. When the air is clear and the sun brilliant, an expert hunter will discover, at a considerable distance, a hare that has been chased, by the fumes which arise from its body. Conducted by this mark, I have seen men whose eyes were accustomed to this kind of observation, part from their company, and go to the distance of half a league to kill a hare in its seat. Hares allow a very near approach, if they are not advanced upon directly, but by a winding and seemingly

* Martial.

inattentive motion. They are more afraid of dogs than of men, and start sooner when they hear or perceive a dog *. Though the hares run faster than the dogs, yet, as they never fly straight out, but double about the place where they were started, the greyhounds, who hunt more by the eye than the scent, generally overtake and kill them. In summer they frequent the fields, the vineyards in autumn, and the woods or coppices in winter; and, in all seasons, they may be raised and chased by hounds. They may also be taken by birds of prey. A perpetual war is carried on against them by owls, buzzards, eagles, foxes, wolves, and men. So numerous are their enemies, that they escape by chance only, and are rarely allowed to enjoy the small portion of time allotted them by Nature.

* This antipathy to the dog is not natural, but acquired. The pursuit of the one occasions the flight of the other. An animal, when persecuted, will endeavour to escape from its enemy, and in many, Nature has implanted an instinctive faculty, which directs them to avoid their destruction; but this is not the case with the hare, as far, however, as respects its fear of the dog: this was proved by Cowper, who introduced a spaniel which had never seen a hare, to a hare that had never seen a dog. "I did it with great caution," says Cowper, "but there was no real need of it. Puss discovered no token of fear, nor Marquis the least symptom of hostility. They eat bread at the same time out of the same hand, and were in all respects sociable and friendly."

Sonnini kept a tame hare, together with two large Angora cats and a hound, all of which were upon friendly terms. It has been observed, that, when domesticated, the hare, like other quadrupeds, is subject to a prolongation of the teeth.

W.

THE BRAZILIAN HARE *†.

The tapeti ‡ seems to make a near approach to the species of the hare or rabbit. It is found in Brazil, and many other parts of America.

* CHARACTER SPECIFICUS.

Lepus Braziliensis. L. auritus, collari albo, cauda nulla. — *Linn. Syst. Nat. Gmel.* i. p. 164. — *Pall. Glir.* p. 30. — *Erxleben,* p. 336.

Lepus Ecaudatus. — *Briss. Quadr.* p. 97.

Cuniculus Braziliensis Tapeti. — *Marcgr. Bras.* p. 223. — *Ray's Quadr.* p. 205.

Tapeti. — *Buff. Hist. Nat. par Sonn.* xxxiii. p. 282.

Brazilian Hare. — *Penn. Hist Quadr.* ii. p. 107, No. 307. — *Shaw's Gen. Zool.* ii. p. 208.

HABITAT

in Braziliæ et Mexici silvis. *W.*

Brazilian hare, with very long ears; a white ring round the neck; face of a reddish colour; chin white; black eyes; colour of the body like the common hare, only darker; belly whitish; no tail; some want the white ring round the neck. — *Pennant's Synops. of Quadr.* p. 252.

† I have removed this animal from Buffon's supplement, as it is acknowledged to be a distinct species of hare, though the author, who describes it under the name of Tapeti, conceives it to be a variety only of the European kind. *W.*

‡ *Tapity,* according to P. d'Abbeville. — *Miss. au Maragnon,* p. 251.

In figure it resembles the European rabbit; and it resembles the hare in size and colour, only it is a little browner. Its ears are very long, and shaped like those of the hare. Its hair is red on the forehead, and whitish on the throat. Some of them have a white circle round the neck: but others have a white throat, breast, and belly. They have black eyes, and whiskers like our rabbits; but they want the tail*. The tapeti resembles the hare in its manner of living, in fecundity, and in the quality of its flesh, which is extremely good. Like the hare, it dwells in the fields or in the woods, and burrows not, like the rabbit†. The animal of new Spain, mentioned by Fernandes under the name of *citli*, appears to be the same with the *tapeti*‡ of Brazil; and both are perhaps only varieties of the European hares, who have passed by the northern lands from the one continent to the other.

* Marcgr. Hist. Nat. Brazil, p. 223, fig. p. 224.

† Pison, Hist. Brazil, p. 102.

‡ Citli.——— Lepores novæ Hispaniæ nostratibus similes, forma atque alimento, sed auriculis longissimis pro corporis magnitudine, latissimisque.—*Fernandes, Hist Anim. Nov. Hisp.* p. 2. cap. 3.

THE BAIKAL HARE *†.

THIS animal is very common in the neighbourhood of Lake Baikal, in Tartary. It is

* CHARACTER SPECIFICUS.

Lepus Tolai. L. cauda abbreviata, auricularum margine summo nigro. — *Linn. Syst. Nat. Gmel.* p. 162. — *Pall. Glir.* p. 17. t. 4. fig. 2.

Lepus Dauricus. — *Erxleb. Mam.* p. 335.

Cuniculus insigniter caudatus coloris leporini. — *Gmel. Nov. Comm. Petrop.* v. p. 357. t. 11. fig. 2.

Le Tolai. — *Buff. Hist. Nat.* xv. p. 138.

Baikal Hare. — *Penn. Quadr.* ii. p. 104. — *Shaw's Gen. Zool.* ii. p. 203.

HABITAT

vulgaris trans lacum Baikal in deserto Gobeensi ad Tibetum usque. *W.*

Baikal hare, with a tail somewhat longer than that of a rabbit; fur of the colour of the common hare; red about the neck and feet; tail black above, white beneath. It is larger than a rabbit; and inhabits the country beyond Lake Baikal. — *Penn. Synop. Quadr.* p. 253.

† There is a difference between the specification and the description of this animal which I am at a loss to reconcile. The Baikal hare or Tolai of Buffon, is well known to have a tail longer than that of the rabbit, but Gmelin, who quotes Pallas, says *cauda abbreviata:* again, the throat and under parts of this species are white; nevertheless, Erxleben, who notices the animal under the specific name of *dauricus*, adds cauda elongata, *gula nigra.* It must be observed, at the same

somewhat larger than the rabbit, which it resembles in the figure of the body, the fur, the gait, the colour, the taste of the flesh, and the habit of digging a retreat in the earth. Their internal structure is likewise the same *; and there is no difference but in the length of the tail; that of the tolai being considerably longer. Hence, it is extremely probable that this animal is only a variety in the species of the rabbit. Rubruquis, when treating of the animals in Tartary, says, "There are rabbits with a long tail, and black and white hairs at the point. . . . . . There are no stags, few hares, a vast number of Gazelles," &c. This passage seems to insinuate, that our short-tailed rabbit is not found in Tartary †, or rather, that it has undergone some variations in that climate, and particularly in the length of the tail; for, as the tolai resembles the rabbit in every other respect, it is unnecessary to consider them as belonging to different species.

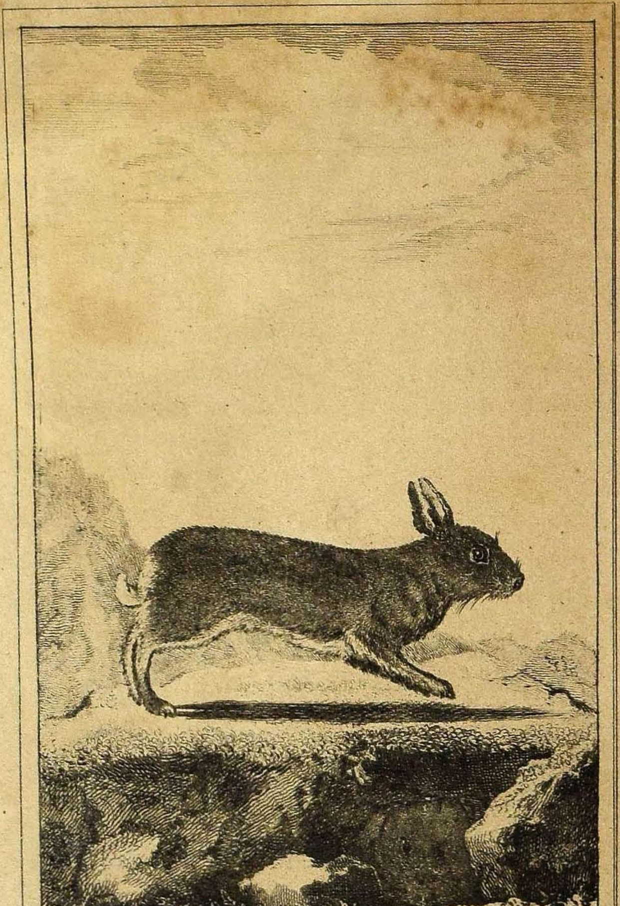
time, that the *Lepus dauricus* of Pallas is the Agotona hare, and is described as entirely wanting a tail.—See *Voyages du Pallas*, 8vo. ed. t. 8. p. 6. No. 5. *W.*

* Cuniculus insigniter caudatus coloris leporini.——Circa internas partes hæc observavi. Cæcum colo paulo angustius erat, sed longius, utpote octo pollicum longitudinem æquans; prope dei insertionem cærulescens, digiti medii capax, sensimque decrescens, in extremitate vix calamum scriptorium latitudine capit, colore ibidem albente gaudens. Œsophagus uti in lepore ventriculum medium subit. A Mongolis *Tolai* dicitur, idemque nomen Russis etiam harum regionum usitatum est.—*Gmelin. Nov. Comment. Ac. Petrop.* tom. v. tab. 11, fig. 2.

† Relation des Voyages en Tartarie, par Rubruquis, p. 25.

1084

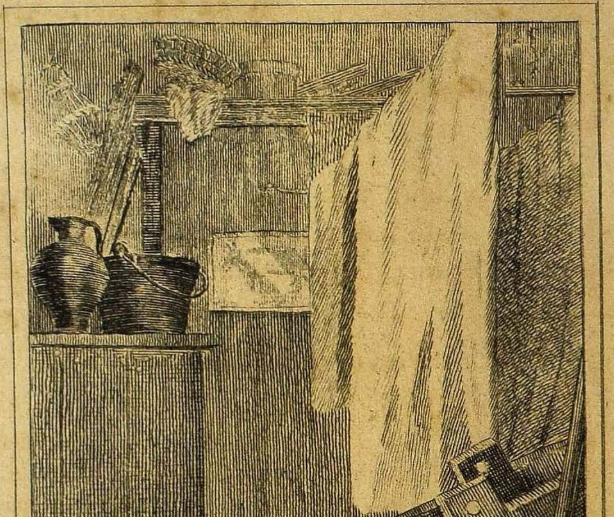
Plate 76



WILD RABBIT

108B

Plate 77



DOMESTIC RABBIT

THE RABBIT*.

AS the hare and rabbit, though very similar both in external form and internal structure, never intermix, they constitute two distinct spe-

* CHARACTER SPECIFICUS.

Lepus Cuniculus. L. cauda abbreviata, subconcolore, auriculis apice atris, cruribus posticis trunco brevioribus.—*Linn. Syst. Nat. Gmel.* i. p. 163.—*Schreber.* iv. t. 236. A.

Lepus Cuniculus. L. cauda abbreviata, pedibus posticis corpore dimidio brevioribus.—*Erxleben. Mamm.* p. 331.

Lepus (cuniculus nostras) caudatus obscure cinereous.—*Briss. Regn. An.* p. 140. No. 4.

Cuniculus.—*Plin.* viii. c. 29, 55, 58.—*Gesn. Quadr.* p. 394. —*Aldrov.* p. 382, fig. p. 385.—*Jonst. Quadr.* p. 161, t. 65. —*Ray's Quadr.* p. 205.

Le Lapin.—*Buff. Hist. Nat. par Sonn.* xxiv. p. 225, pl. 11, 12.

Rabbit.—*Penn. Hist. Quadr.* ii. p. 103.—*Bew. Quadr.* p. 341.—*Shaw's Gen. Zool.* ii. p. 204.

HABITAT

in temperatis et calidioribus Europæ, inque calidioribus Asiæ et Africæ. Exoticus cultus in frigidis; in borealibus non nisi in domibus. *W.*

The ears of the common rabbit are almost naked. The colour of the fur, in a wild state, is brown; that of the tail is black above, and white beneath. In a domestic state, the colour varies from black to pied and perfectly white; the

cies. However, as it has been maintained by hunters*, that the male hares, in the rutting season, pursue and cover female rabbits, I endeavoured to discover what would result from this union. For this purpose, I reared together male rabbits and female hares, and female rabbits and male hares. But nothing was produced from these trials. I only learned from them, that these animals, though very similar in form, are so different in their natures, as to be incapable of producing mules. I put a young hare and a young female rabbit in the same apartment; but they lived not together three months. As soon as they acquired a little strength, they became mortal enemies, and their continual wars terminated in the death of the hare. Of two male hares farther advanced in life, which I confined separately with a female rabbit, one suffered the same fate; and the other, which was very strong, and very ardent, perpetually tormented the rabbit with attempts to cover her, and at last killed her by wounds, or by too violent caresses. I made similar trials with three or four male rabbits, and an equal number of female hares; but the latter died in a still shorter time. Though nothing was produced, I am inclined to think

eyes of the last are of a fine red.—*Penn. Synops. of Quadr.* p. 251.

In Greek, *Δασυποὺς*; in Latin, *Cuniculus*; in Italian, *Coniglio*; in Spanish, *Conejo*; in Portuguese, *Coëlho*; in German, *Cánichen*; in Swedish, *Kanin*; in old French, *Connin*, *Connil*.

* La Venerie de du Fouilloux, p. 100

that they sometimes actually coupled. It is certain, at least, that, notwithstanding the resistance of the female, the male was gratified: and it was more reasonable to expect fruit from these mixtures than from that of the rabbit and hen, which, according to a certain author, would produce *chickens covered with hair, or rabbits covered with feathers* *. This ridiculous conclusion was drawn from a vicious male rabbit, which, having no female, used a hen in the same manner as he would any other moveable. It was extremely improbable, that two species, so remote from each other, should be fertile, while nothing results from the union of the hare and rabbit, whose species are so very analogous.

The fecundity of the rabbit is still greater than that of the hare †. Without believing with Wotton, that, from a single pair put upon an island, six millions were found at the end of one year, it is certain that these animals multiply so prodigiously in a country which is commodious for them, that the produce of the earth is not sufficient to afford them subsistence ‡. They devour

* See l'Art d'Elever des Poulets.

† The fecundity of the rabbit is proverbial: they breed seven times a year, and generally produce eight young at a time. It has been calculated that a single pair of these animals may bring forth in four years 1,274,840!

W.

‡ Spallanzani* tells us, that these animals multiplied so excessively in the little isle of Basiluzzo (one of the Lipari islands), that the inhabitants, reduced to a state of despera-

* Travels in the two Sicilies, vol. ii.

herbs, roots, grain, fruits, and even young trees and shrubs; and if not furnished with dogs and ferrets, the inhabitants would be obliged to desert these countries. The rabbit not only produces more frequently, and in greater number than the hare, but has likewise more resources for escaping his enemies. He easily abstracts himself from the observation of man. The holes which he digs in the earth, where he retires during the day, and impregnates his mate, protect him from the ravages of the wolf, the fox, and birds of prey. Here the whole family live in perfect security. The females nourish their young about two months, and never allow them to go out of their retreat till they are able to shift for themselves. By this means, they avoid all the dangers of youth; while more hares, on the contrary, are destroyed during this period than in all the after-part of their lives.

This management is alone sufficient to prove that the rabbit is superior in sagacity to the hare. The structure of both is the same, and might enable them equally to dig retreats in the earth. Both are equally timid; but the talents of the one being weaker than those of the other, he contents himself with forming a seat on the surface of the ground, where he remains perpetually exposed; while the rabbit, endowed with a superior instinct, digs for himself an asylum in the earth. This labour is unquestionably the effect of sen-

tion at the ravages they committed among the corn, were obliged to oppose them with cats, which pursued and drove them to their burrows. *W.*

timent; for domestic rabbits never give themselves the trouble of digging. They dispense with digging retreats, for the same reason that domestic birds dispense with building nests, because they are equally sheltered from the inconveniences and dangers to which wild birds and wild rabbits are continually liable. It has often been remarked, that when a warren is attempted to be replenished with domestic rabbits, both they and their offspring remain, like the hares, upon the surface; and that they never begin to dig holes for their protection, till after they have endured many hardships, and passed through several generations *.

The colours of the domestic rabbit vary, like those of all other domestic animals; for we have white, black, brown, and spotted rabbits. The black rabbits are rarer than the white, brown, or variegated kinds. All wild rabbits are brown; and even among the domestic ones it is still the predominant colour, for in every litter, though

* With respect to the specific difference between the rabbit and the hare (which we know by habit, but cannot so readily describe by words), Mr. Daines Barrington has made the following remarks: If the hind-legs of an European hare are measured from the uppermost joint of the toe, the number of inches will turn out to be just half the length of the back from the rump to the mouth, the tail not being included. The hind-legs of the rabbit being measured in the same manner, and compared with the back, are not much more than one third. The fore legs of the rabbit are also shorter than those of the hare; the nails are longer, and more slender, resembling those of the mole. — *Phil. Trans.* 1772.

W.

both male and female be white, or both black, or the one white and the other black, some of the young are always brown. It is seldom that above two or three resemble the parents. But the brown rabbits, though in a domestic state, generally produce young of their own colour only; and it is very rare, and seemingly by accident, that they bring forth white, black, or mixed kinds *.

At the age of five or six months, these animals are capable of procreating. They are said to be constant in their amours; and after attaching themselves to a particular female, seldom or ever quit her. The female is almost perpetually in a condition for receiving the male. She goes with young thirty or thirty-one days, and produces from four to eight at a litter. Like the female hare, she has a double uterus, and consequently may bring forth at two different times. Superfœtations, however, seem to be less frequent in this

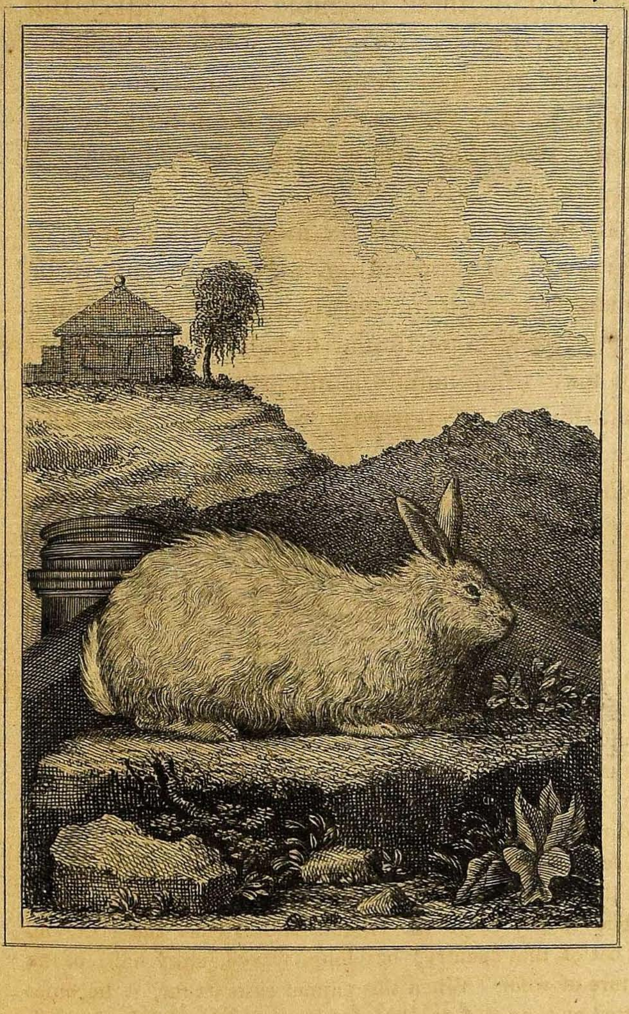
* The head of the domestic rabbit is longer than the wild kind, which is short, and almost round. The prolongation of the cranium, of the frontal bone, and of the muzzle, are certain marks by which we may distinguish the tame rabbit: the hair is also of a much deeper yellow under the feet of the wild rabbit, which the dealers are aware of, and often singe the feet of the tame kind to make them pass for wild rabbits; but the cheat may be easily detected by the smell.

The variety called the Angora rabbit (like the goat and the cat of that country) has long, waved, silky hair, of the texture of wool. When this animal casts its fur, it becomes clotted and tangled, sometimes hanging almost to the ground, so as to resemble an additional leg.

W.

114A

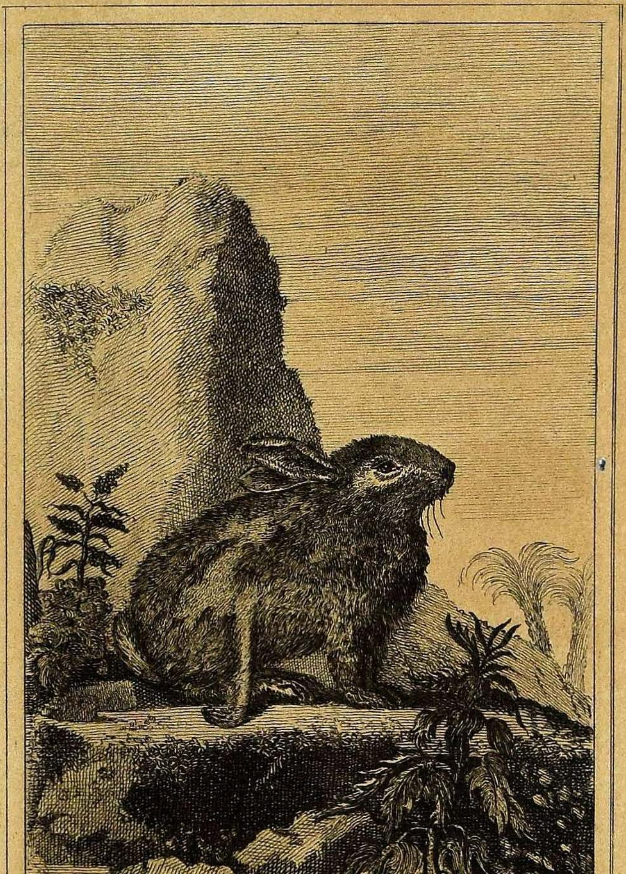
Plate 78



RABBIT of ANGORA

114 B

Plate 79



RABBIT of ANGORA
Casting its Hair

species than in that of the hare. This circumstance may, perhaps, be owing to the constancy of the females, and to their indulging in fewer adventures and unseasonable embraces.

Some days before bringing forth, they dig a new hole, not in a straight line, but angular; at the bottom of which they make an excavation; and they pull great quantities of hair off their bellies, and make a bed of it for the reception of their young. During the two first days, they never leave their offspring: they never go out but when pressed with hunger, and return as soon as they have filled their stomach, which they do with surprising quickness. In this manner, they tend and suckle their young for more than six weeks, during which the father has no knowledge of them. He never enters the hole dug by the mother; and the female, when she leaves her young, frequently shuts up the mouth of the hole with earth diluted in her own urine. But, when they begin to come to the mouth of the hole, and to eat groundsel, or other herbs, presented to them by the mother, the father seems to know them: he takes them between his paws, smooths their hair, and licks their eyes. Each of them, one after another, equally partakes of his care and attention. He receives, at the same time, many caresses from the mother; and, in a few days afterward, she is generally impregnated.

I received the following remarks from M. le Chapt du Moutier, who has amused himself for several years in rearing rabbits: "I began,"

says he, "with only one male and one female. The male was perfectly white, and the female brown. In their posterity, which was very numerous, the brown greatly predominated; there was a considerable number of them white and mixed, and some black. When the female is in season, the male seldom quits her. His constitution is so vigorous and ardent, that I have seen him embrace the female five or six times in less than an hour. In the time of coition, the female lies flat on her belly, with her four paws stretched out; and she utters small cries, which rather indicate pleasure than pain. Their manner of coupling resembles that of the cats, with this difference, that the male bites the neck of the female with less violence. These animals pay much respect to their fathers, which I discovered by the great deference my rabbits entertained for their original father, who was easily distinguished by his whiteness, being the only male of this colour which I preserved. The family soon increased: but those who had likewise become fathers, were always subordinate to their first sire. Whenever they fought, either for females or food, the grandfather ran up to them with full speed; and, as soon as they perceived him, order was reestablished. If he surprised them in the act, he first separated the combatants, and then gave them an exemplary punishment. I had still a farther proof of his dominion over his posterity. Having accustomed them to retire into their apartment upon the blowing of a whistle, when I gave the signal, however distant they

might be, the grandfather put himself at their head, and, though he arrived first, he allowed them all to pass before, and entered last himself. I fed them with bran, hay, and a good deal of juniper; of this last, they eat the berries, the leaves, the bark, and leave nothing but the wood. This food gave a fine flavour to their flesh, and made it equally good as that of the wild rabbit."

These animals live eight or nine years. As they pass the greatest part of their lives in holes, where they enjoy perfect tranquillity, they grow much fatter than hares. Their flesh differs likewise both in colour and taste. The flesh of the young rabbit is very delicate; but that of the old is dry and hard. As I formerly remarked, they are originally natives of warm climates. They were known to the Greeks *; Greece and Spain † seem to be the only places in Europe where they anciently existed. From thence they were transported into more temperate regions, as Italy, France, Germany, Britain, where they are now naturalized. But, in very cold countries, as Sweden ‡, and other parts of the north, they cannot be reared in houses, and they perish when abandoned to the fields. But, on the contrary, they are fond of excessive heat; for we find them in the most southern parts of Asia and Africa, as along the Persic Gulf §, the bay of

* Arist. Hist. Anim. lib. i. cap. 1.

† Plin. Hist. Nat. lib. viii.

‡ Linnæi Faun. Suec. p. 8.

§ L'Hist. Gen. des Voyages, par M. l'Abbé Prevot, tom. ii. p. 354.

Saldana *, in Lybia, Senegal, and Guinea †. They are likewise found in our American islands ‡, where they have been brought from Europe, and have succeeded extremely well §.

* L'Hist. Gen. des Voyages, par M. l'Abbé *Prevot*, tom. ii. p. 449.

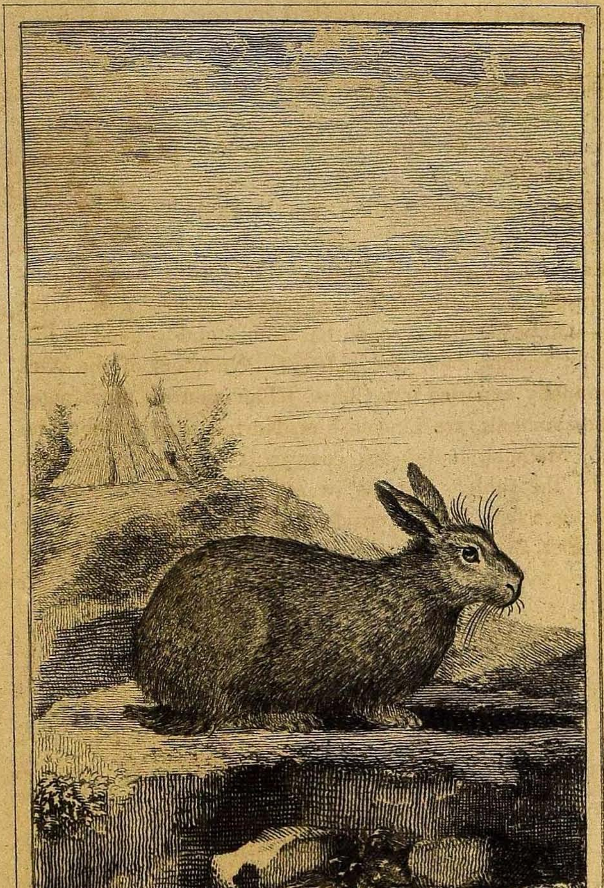
† Leon. Afric. de Afric. Descript. part ii. p. 257; Le Voyage de Guill. Bosman, p. 252.

‡ L'Hist. Gen. des Antilles, par le P. du Tertre, tom. ii. p. 297.

§ England abounds with rabbits: their furs form a considerable article in the manufacture of hats; and such part of the fur as is unfit for that purpose, has been found as good as feathers for stuffing beds and bolsters. Numbers of the skins are annually exported into China. The counties most noted for these animals, are Lincolnshire, Norfolk, and Cambridgeshire. Methold, in the last county, is famous for the best sort for the table. Rabbits swarm in the isles of Orkney, where their skins form a considerable article of commerce. — *Penn. Brit. Zool.* *W.*

118A

Plate 80



SILVER HAIRD RABBIT

OF CARNIVOROUS ANIMALS.

HITHERTO we have treated of useful animals only. The noxious species are few in number; and though, upon the whole, what is hurtful seems to abound more than what is serviceable, yet every thing is well ordered; for in the physical world, evil is subservient to good, and there is nothing really noxious in Nature. If the destruction of animals be hurtful, is not man, considered as forming a part of the general system of animation, the most noxious and pernicious of all beings? He alone sacrifices and annihilates more individuals than the whole carnivorous tribes. The latter are hurtful only, because they are rivals to man, because they have the same appetites, the same taste for animal food; and because, in obedience to this unavoidable and necessary desire, they sometimes dispute with him that prey which he would engross for the gratification of his inordinate appetite; for man always sacrifices more to his intemperance than to his real wants. Born to destroy the subordinate races of animals, he would exhaust all Nature, if, by a fecundity superior to his depredations, she did not repair the perpetual havoc he

makes. But death is only the minister of life, and destruction is the parent of reproduction. However great, therefore, the waste made by man and the carnivorous animals, the fund or total quantity of life is never diminished; for, in proportion to their premature destruction, fresh births are produced.

Large animals constitute but a small part of life: the earth teems with the smaller tribes. Every plant, every grain, every particle of organized matter, contains millions of animated atoms. Vegetables seem to be the great fund of subsistence; but this fund, however inexhaustible, would hardly be sufficient to the still more numerous tribes of insects. Their fecundity, which is equally great, and often quicker than the reproduction of plants, indicates the superiority of their numbers: for plants are only renewed every year; but a single season gives birth to several generations of insects, especially among the minuter tribes. Their multiplication, therefore, if they were not devoured by other animals, would exceed that of vegetables. But many insects feed upon other insects: some tribes, as the spiders, devour indifferently their own as well as many other species; the whole are eaten by the birds; and the wild and domestic fowls serve as nourishment to man, or become the prey of carnivorous animals. Thus violent deaths are equally necessary as natural ones: they are both modes of destruction and of reproduction; the one continues Nature in perpetual youth, and the other preserves the or-

der of her productions, and limits the number of species. Both are effects depending upon general causes: every individual drops at the end of a determined period; or, if prematurely cut off, it was because he was superfluous. How many flowers are cropped in the spring? What numberless beings are extinguished the moment they begin to exist? How many germs are annihilated before they are unfolded? Man and the carnivorous animals feed upon individuals either completely formed, or about to exist. Flesh, eggs, seeds, and germs of every species, constitute their ordinary nourishment. This waste alone might limit the exuberance of Nature. Let us attend to one of those inferior species that serve for nourishment to others. The herrings, for example, present themselves in myriads to our fishers; and, after feeding all the monsters of the northern ocean, they furnish subsistence to Europe during a certain part of the year. If incredible numbers of them were not devoured by other animals, what would be the effects of such an amazing multiplication? They alone would cover the whole surface of the sea. But, by their numbers, they would soon injure and destroy each other. For want of sufficient nourishment, their fecundity would diminish. Contagion and famine would produce the same effects as the present consumption; the number of these animals would by no means increase; but the number of those that feed upon them would greatly diminish. And, as the same remark may be applied to any other species, they

must of necessity prey upon one another. Hence the killing of animals is both a lawful and an innocent practice, because it is founded in nature, and they hold their existence under that seemingly hard condition.

It must be allowed, however, that the motives which have raised doubts concerning this matter, do honour to humanity. Animals, at least those who are endowed with senses, and are composed of flesh and blood, are sensitive beings: like us, they are capable of pleasure, and subject to pain. To sacrifice unnecessarily those animals who approach or live with us, and who, like man, exhibit symptoms of pain when injured, indicates a cruel insensibility; for those whose nature differs greatly from ours, cannot affect us. Natural pity is founded on the analogy which takes place between us and the object that suffers, and the degree of it is proportioned to the nearness of this conformity or resemblance in structure. The word *compassion* implies a division of suffering. In man, the sentiment of pity belongs more to the body than to the mind; and the animals are also susceptible of it. They are moved by the voice of pain; they run to succour each other; they recoil at the view of a dead body of their own species. Thus horror and pity are not so much passions of the mind, as natural affections depending on the sensibility of the body and similarity of structure. This emotion, therefore, ought to diminish in proportion as different animals recede from each other in their nature and conformation. The beating of a dog, or the

killing of a lamb, excite our compassion: but we feel no emotion when a tree is felled, or an oyster swallowed.

Animals, whose organization resembles that of man, must have similar sensations; and the liveliness of these sensations must be proportioned to the activity and perfection of their senses. Those, on the other hand, whose senses are blunt, cannot have exquisite feelings; and those who are deprived of any organ of sense, must likewise want the correspondent sensations. Motion is a necessary effect of the exercise of sentiment. We formerly proved *, that, whatever be the organization of an animal, if it be endowed with sentiment, it must exhibit its feelings by external movements. Thus plants, though properly organized, are insensible beings, as well as those animals who have no apparent motion. In the same manner, animals, who, like the sensitive plant, move their bodies only, but are deprived of progressive motion, have very little sentiment; and even those who are endowed with the power of moving progressively, but whose actions, like those of the automatons, are extremely limited in number, and always performed in the same manner, have only a small portion of sentiment, which is confined to a few objects. In the human species, there are many automatons: education, and the mutual communication of ideas, by means of social intercourse, augment both the quantity and the viva-

* See Discourse on the Nature of Animals.

city of our sentiments. What a vast difference, in this respect, between a savage and a civilized man, between a female Hottentot and a woman of fashion! Among the animals, in like manner, those who live in a domestic state have their feelings improved by their frequent intercourse with man; while those who remain wild preserve only their natural sensibility, which is often more certain, but always more confined, than that which is acquired by education and example.

Besides, considering sentiment entirely as a natural faculty, independent of the movements produced by it, we may still ascertain its different degrees by physical relations, to which too little attention has hitherto been given. To possess a high degree of sensibility, the animated body must form a whole, not only sensible in all its parts, but so constructed, that these parts intimately correspond with each other, in such a manner, that an impression made upon one must necessarily be communicated to all the rest. There must also be a common centre, upon which the various impressions or vibrations must terminate, and this centre must, like a fulcrum, react and reflect all these movements. Thus man, and those animals who resemble him most in organization, will be the most sensible beings. Those, on the contrary, who form not so complete a whole, whose parts have a less intimate correspondence, who have several centres of feeling, and who, under the same covering, seem not to include one perfect animal, but various centres of existence, separate from each other,

are beings of much less sensibility. When a polypus is cut in pieces, each division lives separately; the head of a wasp, after being divided from the body, lives, moves, and even eats as formerly; a lizard, though cut asunder, is neither deprived of motion nor of feeling; the limbs of a lobster are renewed after amputation; the heart of a turtle continues to beat long after it is cut out of the body; the principal viscera of insects, as the heart and lungs, make not a whole in the centre of these animals, but extend along the body, and form a succession of unconnected hearts and windpipes: all these, and similar animals, whose organization is so far removed from that of man, have little sentiment.

In man, and in the animals which resemble him, the diaphragm appears to be the centre of sentiment: it is upon this nervous part, which conveys the impressions of pain and pleasure, that all the movements of the sensible system are exerted. The diaphragm makes a transverse division of the body into two equal parts, the superior of which includes the heart and lungs, and the inferior contains the stomach and intestines. This membrane is endowed with such an extreme sensibility, and is so necessary to the communication and propagation of feeling, that the slightest wound, whether in its centre or circumference, is always accompanied with convulsions, and often with death. The brain, therefore, which has been considered as the seat of sensation, is by no means the centre of sentiment; for it may

be wounded, and even parts of it cut away, without destroying the animal.

Sensation, therefore, ought to be distinguished from sentiment. Sensation is only a vibration, or impression on the sense; but sentiment is the same sensation rendered agreeable or disagreeable by the propagation of the vibration through the system. The essential characteristic of sentiment is pleasure or pain; for all other movements, though they pass within us, are totally indifferent, and do not affect us. All the external motions, and the exercise of every animal force, depend on sentiment, which only acts in proportion as it is affected. The diaphragm, therefore, which we consider as the centre of sentiment, is also the centre of force, or common fulcrum upon which every force is exerted.

All lively emotions, whether pleasant or painful, sickness, fainting, and every sensation that has become agreeable or disagreeable, are felt internally in the region of the diaphragm. In the brain, on the contrary, there is no indication of sentiment. We feel only pure sensations in the head. We can, indeed, recal any sensation, whether agreeable or disagreeable; and, if this operation, which is performed in the head, be followed by a real and lively sentiment, we immediately feel the impression of it in the region of the diaphragm. Thus, in the fœtus, where this membrane is not exercised, there is no sentiment, or at least it is so feeble as to produce no effect; for the little motions of a fœtus are me-

chanical, and have no dependence either on sensation or on the will.

Whatever be the nature of that matter, which serves as a vehicle to sentiment, and gives rise to muscular motion, we know that it is propagated by the nerves, and that it is instantaneously communicated from one extremity of the system to the other. We know not how this movement is performed, whether by vibrations like those of elastic cords, or by a subtile fire similar to that of electricity, which resides not only in animated and inanimated bodies, but is perpetually regenerated by the motion of the heart and lungs, by the friction of the blood in the arteries, and also by the action of external causes upon the organs of sense. It is certain, however, that the nerves and membranes are the only sensible parts of an animal body. The blood, the lymph, the fat, the bones, the flesh, and all the other solids and fluids, are, in themselves, totally insensible. The brain is a soft unelastic substance, and, of course, incapable of producing or of propagating the vibrations of sentiment. The meninges, on the contrary, which serve as an envelope or covering to all the nerves, are exceedingly sensible. Like the nerves, the meninges originate in the head, and, like them, they divide into branches, and extend along with their most minute ramifications. They may be regarded as nerves rendered flat; for they are of the same substance, have nearly the same degree of elasticity, and form a necessary part of the sensible system. If the head, therefore, be the seat of

sensation, it must reside in the meninges, and not in the medullary part of the brain, the substance of which is entirely different.

The opinion, that the brain is the fountain of sensation, and the centre of all sensibility, arose from this circumstance, that the whole nerves, which are the organs of sensation, terminate in the brain; and hence it was regarded as the only part fitted to receive every impression or vibration. This supposition appeared so simple and so natural, that the physical impossibility which it implies, though abundantly evident, was never attended to: how can an insensible part, a soft inactive substance, such as the brain, be itself the instrument of all sensation and motion? How can this soft insensible substance not only receive impressions, but retain them for a long time, and propagate vibrations through all the solid and sensible parts of the body? It may, perhaps, be replied, with Descartes and Peyronie, that the principle of sensation resides not in the brain, but in the pineal gland, or in the cortical substance. But, from examining the parts of the brain, it is apparent, that neither the pineal gland nor cortical substance contains nerves: they are surrounded with the insensible part of the brain, and so separated from the nerves, that they can receive none of their movements. Hence these suppositions, as well as the former, fall to the ground.

But what is the use, what are the functions of this noble and principal part of the body? Is not the brain found in every animal? Is it not

larger in man, in the quadrupeds, and in the birds, who have all a great deal of sentiment, than in fishes, insects, and other animals which have little sentiment? When compressed, is not all motion suspended? If this part is not the principle of action, why is it so essentially necessary? Why is it even proportioned, in every species of animals, to the quantity of sentiment they possess?

These questions, however difficult they may appear, admit of easy solutions. Upon an attentive and unprejudiced examination, the brain, as well as the medulla oblongata, and spinal marrow, which is a prolongation of the brain, are only a species of mucilage, and hardly organized. We discover in it, indeed, the extremities of small arteries, which terminate there in vast numbers, and carry no blood, but a white nutritious lymph only. These minute arteries, or lymphatic vessels, when separated from the brain by maceration, appear like very fine threads. The nerves, on the contrary, never penetrate the substance of the brain, but terminate on its surface; but they first lose their solidity and elasticity; and their extremities next the brain are soft, and almost mucilaginous. Hence the brain, which is nourished by the lymphatic arteries, furnishes, in its turn, nutriment to the nerves, which ought to be considered as a species of vegetation issuing from the brain in trunks and branches, which afterwards divide into an infinite number of ramifications. The brain is to the nerves, what the soil is to plants: the ex-

tremities of the nerves are the roots, which, in every vegetable, are more tender and soft than the trunk or branches. They contain a ductile matter, proper for the growth and nourishment of the nervous tree. This ductile matter they derive from the substance of the brain itself, to which the arteries perpetually carry the necessary supplies of lymph. The brain, therefore, instead of being the origin of sensation, or the principle of sentiment, is only an organ of secretion and nutrition, but a very essential organ; for, without it, the nerves would neither grow, nor be supported.

The brain is largest in man, quadrupeds, and birds; because the quantity of nerves is greater than in the fishes and insects, whose sentiment, for this reason, is feeble: the latter have a small brain, proportioned to the small quantity of nerves it has to nourish. On this occasion, I must remark, that man's brain, as has been alleged, is not proportionally larger than that of any other animal: there are species of monkeys, and of the cetaceous tribes, which have larger brains, in proportion to the size of their bodies, than man: and this fact likewise proves, that the brain is neither the seat of sensation, nor the principle of sentiment; for, if this were the case, these animals would have finer sensations, and more sentiment, than the human species.

Plants absorb not the solid parts of earth or water: these parts must be reduced by heat into thin vapours, before they can be absorbed by the roots. In the same manner, the nerves are nou-

rished by the subtile moisture of the brain, which is absorbed by their extremities or roots, and from thence conveyed to all the branches of the sensitive system. This system, as formerly remarked, forms a whole, all the parts of which have such an intimate connexion, that none of them can be injured without wounding the rest. The slightest irritation of a small nerve is sufficient to convulse the whole body; and the pain, and consequent convulsions, cannot be cured but by cutting the nerve above the injured part; and then all the parts upon which this nerve was distributed, become for ever immoveable and insensible. The brain ought not to be regarded as an organic portion of the nervous system; because it has not the same properties, nor consists of the same substance, being neither solid, nor elastic, nor sensible. I acknowledge, that, when compressed, sensation ceases. But this alone proves it to be a body foreign to the nervous system, which, acting by its gravity on the extremities of the nerves, presses and benumbs them, in the same manner as a weight applied to the arm, leg, or any other part of the body, benumbs the nerves, and annihilates their sensation. It is true, this cessation of feeling, by compression, is only a suspension or a benumbing, which vanishes the moment the compression is removed, and sensation and motion are again renewed. I farther acknowledge, that, by tearing the medullary substance of the brain, convulsions, privation of feeling, and death itself, will ensue. But these effects are produced, because the nerves are en-

tirely deranged, and the whole of them materially injured in their very source.

To these arguments particular facts might be added, which would equally show that the brain is neither the centre of sentiment, nor the seat of sensation. We have seen animals, and even children, born without head or brain, and yet they had sentiment, motion, and life. There are whole classes of animals, as insects and worms, in whom the brain is not perceptible, having only a part corresponding to the medulla oblongata, and spinal marrow. It is, therefore, more rational to place the seat of sensation in the spinal marrow, which no animal wants, than in the brain, which is not an universal part, common to all sensitive beings.

The great obstacle to the advancement of human knowledge, lies not in the objects themselves, but in our manner of considering them. Man's body, however complicated, is more simple than his ideas. It is less difficult to see Nature as she is, than to know her in the dress she is exhibited to us. She only wears a veil; but we give her a mask. We conceal her with prejudices. We suppose that she operates as we act and think. Her actions, however, are evident; but our thoughts are obscure. To her operations we transfer the abstractions of our own minds. We judge of her designs by our own views; and we perpetually blend her works, which are uniform, her facts, which are always certain, with the fluctuating illusions of our own imagination.

I speak not here of systems purely arbitrary, or

of frivolous and imaginary hypotheses, but of the methods generally employed in the investigation of Nature. Even the method of experiment has produced more errors than truths. This method, though the most certain, requires great dexterity of management: a small deviation either leads to barren regions, or to rare and obscure objects. We nevertheless assemble them together, and ascribe to them general relations and common properties; and, as mankind pass and repass on the crooked paths which have been formed, the road appears to be clear and beaten. Though it terminates in nothing, the whole world follows, the method is adopted, and the consequences derived from it are received as fixed principles. I might demonstrate this doctrine by exposing the origin of what are called *principles* in all the sciences, both abstract and real: in the former, the general basis of the principle is abstraction, or one or two suppositions: in the latter, the principles are only consequences, good or bad, of the methods which have been observed. I shall here limit myself to the science of anatomy: Did not the first man who, contrary to a repugnance of Nature, opened a human body, believe that, by dissecting and examining its different parts, he would soon discover its structure, mechanism, and functions? But having found the subject to be infinitely more complicated than he imagined, he was soon obliged to renounce his pretensions, and to institute a method, not for distinguishing and judging, but solely in order that he might see the parts in a

certain train or order. Many ages were necessary to bring this method to any degree of perfection; and it alone still occupies the attention of our most accomplished anatomists. This method, however, is not the science, but only the road which ought to lead to it, and which, perhaps, might have led to it, if, instead of travelling always in the same narrow path, anatomists had extended the tract, and compared the human body with that of the other animals. What real knowledge can be derived from a single object? Is not every science founded on the comparison of similar and different objects, of their analogous or opposite properties, and of all their relative qualities? Absolute knowledge, if it has an existence, exceeds the powers of man: we can judge only by the relations of things. When solely occupied with the method of investigating a subject, and when we consider it independent of what is analogous, or different from it, we can never arrive at real knowledge, and far less rise to any general principle: in this case, we can invent names only, and make descriptions of the object, and of all its parts. Thus, though human bodies have been dissected for 3,000 years, anatomy is still nothing but a nomenclature; and hardly any advances have been made toward the real object, which is the knowledge of the animal economy. Besides, the method itself is still imperfect, though it ought to be clear and simple, since it depends on inspection, and has no end but that of denominations. As this nominal knowledge has been mistaken

for science, anatomists, instead of limiting the number of objects, have been anxious to augment the number of names. They have loaded the subject with minute and fruitless details. They were inclined to discover differences, where every thing was alike. In creating new names, they imagined they were exhibiting new objects; and the description of a minute part, which had been either overlooked or neglected by former anatomists, was dignified with the appellation of a *discovery*. Even the names themselves, being frequently substituted in place of the objects, with which they have no relation, have only served to augment the confusion. Are not the *nates* and *testes* small parts of the brain similar to the whole, and unworthy to be distinguished by particular denominations? These names, bestowed originally from caprice, at last gave rise to new opinions and prejudices. Others, given to parts which either did not exist, or were imperfectly viewed, have been the sources of fresh errors. How many functions and uses have been ascribed to the pineal gland, and that pretended void in the brain, called the *fornix*, while the former is only a simple gland, and the existence of the latter is doubtful, being probably produced by the hand of the dissector?*

The most difficult part of science, therefore, is not to know those things which form the direct object of it, but to strip them of a thousand false colours under which they have been con-

* See Steno.

cealed, to examine the foundation and effects of the method employed by former inquirers, to reject every arbitrary arrangement, and, in fine, to endeavour to detect every error or prejudice, that has been adopted. All these precautions are necessary to uncover Nature; but, to know her, we have only to compare her with herself. In the animal economy, her appearance is very mysterious, not only because the subject is complex, but because, having neglected those modes of comparison which alone could afford light, we have been left to wander in the darkness of vague hypotheses. The human body has been described in millions of volumes; while the anatomy of the other animals has been almost entirely neglected. In the human subject, we have distinguished, named, and described the most minute parts; while we are ignorant whether these, or even parts of greater magnitude and importance, exist in other animals. Particular functions have been ascribed to particular organs, without knowing whether the same functions are not performed in other beings, though deprived of these organs. So that, in the different explications of the animal economy, we labour under the double disadvantage of having commenced with the most complicated subject, and of reasoning concerning this subject without the aid of analogy.

In the course of this work, we have observed a very different method. Uniformly comparing Nature with herself, we have traced her in her relations, in her differences, and in her extremes. To mention here only those parts rela-

tive to the animal economy, of which we have had occasion to treat, as the generation, the senses, the movements, the sentiment, and the nature of animals, the reader will easily perceive, that, after all the labour bestowed in discarding false ideas, in rooting out established prejudices, and in separating truth from arbitrary conceits, the only art we have employed is that of comparison. If we have succeeded in throwing light upon these subjects, it must be ascribed, not so much to ingenuity or labour, as to the method we have followed, and which we have endeavoured to render as general as our knowledge would permit. Before giving general ideas, we have invariably exhibited the particular results, or effects.

We shall now content ourselves with relating a few facts, which will be sufficient to prove, that man, in the state of nature, was never destined to live upon herbs, grain, or fruits; but that, in every period of his existence, he, as well as most other animals, eagerly desired to nourish himself with flesh.

The Pythagorean diet, though extolled by ancient and modern philosophers, and even recommended by certain physicians, was never indicated by Nature. In the golden age, man was innocent as the dove; his food was acorns, and his beverage pure water from the fountain: finding every where abundant subsistence, he felt no anxieties, but lived independent, and always in peace, both with himself and the other animals. But he no sooner forgot his native dignity, and

sacrificed his liberty to the bonds of society, than war and the iron age succeeded that of gold and of peace. Cruelty, and an insatiable appetite for flesh and blood, were the first fruits of a depraved nature, the corruption of which was completed by the invention of manners and of arts.

These are the reproaches which, in all periods, have been thrown upon man, in a state of society, by certain austere and savage philosophers; flattering their private pride by the humiliation of the whole species, they have exhibited this unnatural picture, which has no value but in the contrast: to hold out to man chimerical ideas of happiness, may, perhaps, be sometimes useful.

Did this state of ideal innocence, of exalted temperance, of entire abstinence from flesh, of perfect tranquillity, of profound peace, ever exist? Is it not a fable, where man has been employed as an animal, to give us lessons of moral instruction? Is it even possible to conceive the existence of virtue previous to society? Does the loss of this savage state merit regret? Was man, while a wild, unsocial animal, more dignified than the polished citizen? Yes; for every evil springs from society; and what does it import whether there was virtue in a state of nature, if it gave rise to happiness, if man were only less miserable than in his present condition? Liberty, health, strength, are not these preferable to effeminacy, sensuality, and voluptuousness, accompanied with slavery? The absence of pain is more estimable than a thousand pleasures:

what is happiness, but to have nothing to desire?

If this representation were just, they should go farther, and tell us, that it is better to vegetate than to live, to have no desires than to gratify our appetites, to doze perpetually in apathetic slumbers, than to open our eyes to view the beauties of Nature; and, in a word, to sink below the condition of brutes, or to become masses of inanimate matter attached to the earth, than to be active and sentient beings, capable of receiving pleasure from a thousand sources.

But, instead of disputing, let us attend to facts; we see not the ideal, but the real state of nature. Is the savage inhabitant of the desert a tranquil being? Is he a happy man? For we must not suppose, with a certain philosopher, one of the most ferocious censors of humanity *, that the distance from man in a pure state of nature, to the savage, is greater than from the savage to us; that the ages elapsed before the invention of words, have been longer than those which were necessary for the perfecting of signs and of language. I have always thought, that, in reasoning concerning facts, all suppositions ought to be banished till every thing presented by Nature be candidly examined. Now, we find that mankind descend, by imperceptible degrees, from the most enlightened and polished nations, to people of less genius and industry; from the latter, to others more gross, but still subject to kings and

* Rousseau.

to laws; from these, again, to savages, who exhibit as many different shades as the polished nations. Some savages form numerous nations subject to chiefs: smaller societies of them are governed by customs: and the most solitary and independent species constitute families, and submit to their fathers. Thus an empire and a monarch, a family and a father, are the two extremes of society. These extremes are likewise the boundaries of Nature: if they extended farther, in traversing the numberless solitudes of the globe, we must have discovered those human animals, who, like the monkeys, are deprived of speech, the males separated from the females, their offspring abandoned to the elements, &c. Even supposing the constitution of the human body to be very different from what we see it, and that its growth were more rapid, it is impossible to maintain, that man ever existed without forming families; because, if not cherished and attended for several years, the whole children must have inevitably perished. Whereas other animals require the care of the mother a few months only. This physical necessity is a perfect demonstration, that the human species could neither multiply nor exist independent of society; and that the attachment of parents to children is natural. This attachment must unite the parents and children into a small society, which alone would be sufficient to accustom them to make certain gestures, to utter certain sounds, and inure them to every expression of sentiment and of desire. All this is attested by facts; for the

most solitary savages have, like other men, the use of signs and of words.

Thus the state of pure nature is a known state: it is that of the savage living in the desert, but living in family, knowing his children, and being known by them, using words, and making himself understood. The savage girl picked up in the woods of Champagne, and the man found in the forests of Hanover, are not exceptions to this doctrine. They had lived in absolute solitude; and could not, therefore, have any idea of society, or of the use of words: but if they had ever met, the propensity of Nature would have constrained, and pleasure united them. Attached to each other, they would soon have made themselves understood; they would have first learned the language of love, and then that of tenderness for their offspring. Besides, these savages must have sprung from men in society, and been left in the woods at the age of four or five years; for, before this period, they could not have existed. They must have been old enough to be able to procure subsistence, but not to retain the ideas which had been communicated to them.

Let us, then, examine this man of nature, this savage, living in the family state. If the family prospers, he will soon become the chief of a numerous society, of which all the members will have the same manners, observe the same customs, and speak the same language. At the third or fourth generation, new families will arise, who may live separately; but, being

united by the common bonds of customs and language, they will form a small nation, which, increasing with time, may, according to circumstances, either become one people, or remain in a state similar to that of those savage nations with which we are acquainted. If these new men live under a mild climate, and upon a fertile soil, they may occupy, in the full possession of liberty, a considerable space, beyond which, if they meet with nothing but deserts, or men equally new with themselves, they will remain savage, and become, according to circumstances, either friends or enemies to their neighbours. But when, under a severe climate or ungrateful soil, they find themselves pinched by numbers, or cramped for want of room, they will make irruptions, form colonies, and blend themselves with other nations, of which they will either become the conquerors or the slaves. Thus man, in every situation, and under every climate, tends equally toward society. It is the uniform effect of a necessary cause; for, without this natural tendency, the propagation of the species, and, of course, the existence of mankind, would soon cease.

Having discussed the origin of society, and shown that it is founded on Nature, let us next inquire what are the appetites and taste of savages. In this investigation, we shall find, that none of them live solely on fruits, herbs, or grain; that they all prefer flesh and fish to other aliments; that pure water is not pleasant to them; and that they endeavour either to make

for themselves, or to procure from others, a less insipid beverage. The savages of the south drink the water of the date-tree; those of the north swallow large draughts of whale oil; others make fermented liquors; and the whole, without exception, discover a violent passion for ardent spirits. Their industry, dictated by necessity, and excited by their natural appetites, is confined to the making of instruments for hunting and fishing. A bow and arrows, a club, a net, and a canoe, constitute the whole of their arts, and are all destined to procure a species of food corresponding to their taste: and, what corresponds with their taste, must be agreeable to Nature; for, as formerly remarked*, man would die of inanition, if he took not more substantial food than herbs alone. Having but one stomach and short intestines, he could not take a sufficient quantity of such meagre food as would afford him proper nourishment. The same remark is applicable to fruits and grain; for, though corns and other grains have been highly improved by culture, and contain a greater quantity of organic nutritive particles, than any of those which are produced spontaneously by Nature; yet, if man were denied any other food, he would only drag out a feeble and languishing existence.

View those solitary enthusiasts, who abstain from every thing that has had life, who, from motives of sanctity, renounce the gifts of the

* See vol. iv. art. Ox.

Creator, fly from society, and shut themselves up within sacred walls, against which Nature continually revolts: confined in those living tombs, where they contemplate nothing but death, their mortified visages and hollow eyes indicate perpetual efforts to support a languishing, feeble, and useless existence. They take food, but their hunger never abates. Though aided by the fervour of a romantic imagination, they are enabled to resist the effects of this cruel abstinence for a few years only, and may be said rather to die daily than to live.

If man were obliged to abstain totally from flesh, he could not, at least in our climates, either exist or multiply. This diet may, perhaps, be sufferable in southern countries, where the fruits are better concocted, and the plants, roots, and grains more nourishing. The Brahmans, however, rather form a sect than a people; and their religion, though very ancient, has never extended beyond their own climate.

This religion, founded on metaphysics, is a striking example of the lot of human opinions. By collecting the scattered fragments which remain, it is unquestionable that the sciences have been very anciently cultivated, and perhaps ripened to a degree of perfection beyond what they now are. It has been known long before the present æra, that all animated beings contained indestructible living particles, which passed from one body to another. This truth, adopted at first by philosophers, and afterwards more generally diffused, would preserve its purity

during the enlightened ages only. A revolution of dark periods having succeeded, no more of the living organic particles were remembered than what was sufficient to give rise to the notion, that the living principle of animals constituted an indestructible whole, which separated from the body after death. To this ideal whole they gave the name of *soul*, which they soon regarded as a being really existing in all animals; and combining with this chimerical being, the real, but disfigured, idea of the passage of living particles, they maintained, that, after death, this soul transmigrated successively and perpetually from one body to another. From this system man was not excepted: they quickly associated morality with metaphysics: they hesitated not to hold that this surviving being retained, in all its transmigrations, its former sentiments, affections, and desires. Weak minds trembled. They contemplated with horror the passage of the soul from an agreeable lodging to be an inhabitant of an unclean and loathsome animal. Every new fear engenders a fresh superstition. In killing an animal, they were terrified lest they should murder their mistress or their father. They regarded every brute as their neighbour: and, at last, both from motives of tenderness and of duty, they maintained that they ought to abstain from every thing endowed with life. This is the origin and progress of the most ancient religion of India: an origin which shows, that truth, when committed to the multitude, is soon disfigured; that a philosophical opinion

never becomes popular till it has changed its form; but that, by means of this preparation, it may prove the basis of a religion, the stability of which will be proportioned to the universality of the prejudice, and, being founded on truths misunderstood, it must be environed with obscurity, and, of course, it will have an air of mystery, of grandeur, and of incomprehensibility: in fine, that fear, combining with reverence, will make this religion degenerate into superstitious and ridiculous practices, which, however, will take root, and produce rites that at first will be scrupulously observed, but will so gradually alter with time, that even the opinion which gave them birth, can only be traced in false traditions, in proverbs, and in tales puerile and absurd. From hence we may conclude, that every religion founded on human opinions is false and variable; and that, to promulgate the true religion, which depends not on the fancies of men, and which is constant, unalterable, and will always be the same, is the prerogative of God alone.

But, to return to our subject. An entire abstinence from flesh can have no effect but to enfeeble nature. Man, to preserve himself in proper plight, requires not only the use of this solid nourishment, but even to vary it. To obtain complete vigour, he must choose that species of food which is most agreeable to his constitution; and, as he cannot preserve himself in a state of activity but by procuring new sensations, he must give his senses their full stretch, and eat a

variety of meats, to prevent the disgust arising from an uniformity of nourishment. But he must avoid every excess, which is still more noxious than abstinence.

Those animals which have but one stomach, and short intestines, are obliged, like man, to feed upon flesh. It is an unquestionable fact, that all animals which have more stomachs than one, and long intestines, like the cow, sheep, goat, &c., are herbivorous, and that those which have but one stomach, and short intestines, like men, dogs, wolves, lions, &c., are carnivorous.

It must not, however, be concluded, that herbivorous animals are under a physical necessity of feeding on herbs alone, though the carnivorous tribes can by no means subsist without flesh. We maintain only, that the former can be sufficiently nourished without the use of flesh; not that they would not have recourse to this food, if Nature had endowed them with talents adapted to the purposes of seizing prey; for we have seen sheep, calves, goats, and horses, eat, with avidity, milk, eggs, and even flesh, when cut down and seasoned with salt, though they had not been previously accustomed to such food. We may, therefore, maintain, that the taste for flesh is an appetite common to all animals, and that it is exerted with more or less vehemence or moderation, according to their particular conformation; for this appetite is apparent not only in man and the quadrupeds, but in birds, fishes, insects, and worms; to the last of which, it would

appear, all flesh has been ultimately destined by Nature.

Nutrition, in every animal, is performed by organic particles, which, after being separated from the gross mass of aliment, by means of digestion, mingle with the blood, and are assimilated to all the parts of the body: but, independent of this principal effect, which is always proportioned to the quality of food, another effect is produced, which depends on the quantity or bulk of the nourishing substances. The stomach and intestines consist of flexible membranes, which occupy a considerable space within the body. These membranes, to preserve them in a proper state of tension, and to counterbalance the action of the neighbouring organs, require to be always partly filled. If, for want of nourishment, this large space be left entirely void, the membranes, having no internal support, collapse, and adhere to each other, which gives rise to weakness, and all the symptoms of extreme want. Thus the aliments, beside answering the purposes of nutrition, serve as a ballast to the body. Both their presence and their volume are necessary to maintain the equilibrium between the internal parts, which act and react against each other. When a man dies of hunger, it is not so much for want of nourishment, as of a proper poise to the body. Thus animals, and especially the most voracious tribes, when pressed with hunger, are so eager to fill the internal void, that they swallow earth and stones. Clay has been found in the stomach

of a wolf; and I have seen swine eat it greedily. Most birds swallow pebbles, &c. This is not the effect of taste, but of necessity; for the most craving want is, not to refresh the blood with new chyle, but to maintain an equilibrium in the action of the great parts of the animal machine.

THE WOLF*.

THE wolf is one of those animals whose carnivorous appetite is excessively strong. Though he has received from Nature the means of grati-

* CHARACTER SPECIFICUS *.

CANIS LUPUS. C. cauda incurvata. — *Linn. Syst. Nat. Gmel.* i. p. 70. — *Erxleben. Mam.* p. 556.

Canis ex griseo flavescens. — *Briss. Quadr.* p. 170.

LUPUS. — *Gesn. Quadr.* p. 634. — *Aldrov.* p. 144. — *Jonst. Quadr.* p. 89. — *Ray's Quadr.* p. 173.

LE LOUP. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 289, pl. 13.

WOLF — *Penn. Hist. Quadr.* i. p. 213. — *Arctic Zool.* i. p. 38. — *Brit. Zool.* i. pl. 5. — *Shaw's Gen. Zool.* i. p. 290.

HABITAT

in Europa, Asia, America in Sylvis: non intra circulum arcticum. W.

The wolf is ranked in the same genus with the dog by Linnæus and others. Pennant describes him in the following manner: — "WOLF — dog with a long head, pointed nose, ears erect and sharp, tail long, bushy, and bending down; teeth large; colour generally pale brown, tinged

* For the generic character, see vol. iv. p. 337.

150 A

Plate 81

WOLF.

fying this taste, though she has bestowed on him arms, craftiness, strength, agility, and every thing necessary for discovering, seizing, conquering, and devouring his prey; yet he often dies of hunger; because men have declared war against him, put a price on his head, and forced him to fly to the forests, where he finds only a few species of wild animals, who escape from him by the swiftness of their course, and whom he cannot surprise but by chance, or by a patient, and often fruitless attendance at those places to which they generally resort. He is naturally clownish and dastardly; but want makes him ingenious; and necessity gives him courage. When pressed with famine, he braves danger; he attacks those animals which are under the protection of man, especially such as he can transport with ease, as lambs, small dogs, and kids; and, when successful in his bloody expeditions, he returns often to the charge, till, being wounded, chased, and maltreated by men and dogs, he retires, during the day, to his den; but issues forth in the night, traverses the country, roams about the cottages, kills all the animals which have been left without, digs the earth under the doors, enters with a dreadful ferocity, and puts every living creature to death, before he chooses to depart, and carry off his prey. When these inroads happen to be

with yellow; sometimes found white, and sometimes black; taller than a large greyhound."

In Greek, λυκος; in Latin, *Lupus*; in Italian, *Lupo*; in Spanish, *Lobo*; in German, *Wolff*; in Swedish, *Ulf*; in Polish, *Wilk*; in French, *Le Loup*.

fruitless, he returns to the woods, searches about with avidity, follows the tract of wild beasts, and pursues them in the hope that they may be stopped and seized by some other wolf, and that he may be a partaker of the spoil. In fine, when his hunger is extreme, he loses the idea of fear; he attacks women and children, and even sometimes darts upon men, till, becoming perfectly furious by excessive exertions, he generally falls a sacrifice to pure rage and destruction.

The wolf, both externally and internally, has so strong a resemblance to the dog, that he seems to have been formed upon the same model. But he exhibits the same characters under a mask. The figure is similar; but the result is directly reversed. Their natural dispositions are so opposite, that they are not only incompatible, but repugnant by Nature, and inimical by instinct. A young dog trembles at the first glance of a wolf. The odour of the wolf, though new and unknown, excites such an aversion in the dog, that he flies, and comes quivering to the feet of his master. A mastiff, who knows his own strength, though terrified at the appearance of a wolf, attacks him with courage, endeavours to put him to flight, and exerts every effort to get rid of an odious object. They never meet, but either flight or death is the consequence. When the wolf is strongest, he mangles and devours his prey. The dog, with more generosity, contents himself with victory; he finds no savory odour in the body of a dead enemy, but abandons him to be food for the ravens, and even to

other wolves; for wolves eat the carcasses of each other, and, when one is much wounded, the others follow the blood, and assemble in troops to dispatch him.

The dog, even when wild, is not a fierce animal. He is easily tamed, and attaches himself with fidelity to his master. The young wolf may also be tamed; but he feels no attachments; Nature in him is too powerful for education: with age he resumes his ferocious character, and returns, with the first opportunity, to his savage state. Dogs, even those of the most clownish race, love to associate with other animals, and are naturally disposed to accompany them: it is by instinct alone, and not by education, that they know how to conduct and guard the flocks. The wolf, on the contrary, is an enemy to all society, and keeps no company even with those of his own species. When several wolves appear together, it is not a society of peace, but of war; it is attended with tumult and dreadful howlings, and indicates an attack upon some large animal, as a stag, an ox, or a formidable mastiff. This military expedition is no sooner finished, than they separate, and each returns in silence to his solitude. There is even little intercourse between the males and females: they feel the mutual attractions of love but once a year, and never remain long together. The females come in season in winter: many males follow the same female; and this association is more bloody than the former; for they growl,

chafe, fight, and tear one another, and often sacrifice him that is preferred by the female. The female commonly flies a long time, fatigues her admirers, and retires, while they sleep, with the most alert or most favourite male.

The season of love continues only twelve or fifteen days; it commences with the oldest females; the young ones are not so early disposed. The males have no marked period, but are equally ready at all times. They go from female to female, according as they are in a condition to receive the male: they begin with the old females about the end of December, and finish with the young ones in the month of February or beginning of March. The time of gestation is about three months and a half*; and young whelps are found from the end of April to the month of July. This difference in the time of gestation between the she-wolf, who carries a hundred days, and the bitch, who carries only sixty days, proves that the wolf and dog differ as much in their constitutions, and particularly in one of the chief functions of the animal economy, as they do in their tempers. Thus, the wolf and dog have never been regarded as the same animal but by the nomenclators of natural history, who, being acquainted with the surface of Nature only, never extend their views beyond their own methods, which are always deceitful, and often erroneous, even in the most obvious facts. The

* See Nouveau Traité de Venerie, p. 75.

dog and wolf cannot copulate, or produce an intermediate race *. Their dispositions are opposite, and their constitutions different. The wolf lives much longer than the dog; the former brings forth but once a year, and the latter twice or thrice. These distinctions are more than sufficient to demonstrate the two animals to be of very different kinds. Besides, upon a closer examination, we easily perceive, that, even externally, the wolf differs from the dog by essential and uniform characters. The appearance of the head and form of the bones are by no means the same. The cavity of the eye in the wolf is placed obliquely; the orbits are inclined; the eyes sparkle, and shine in the dark; instead of barking, he howls; his movements, though quick and precipitate, are more equal and uniform; his body is stronger, but not so flexible †; his members are firmer, his jaws and teeth larger, and his hair coarser and thicker.

But these animals have a great resemblance in their internal structure. The wolves copulate like the dogs, and have an osseous penis, surrounded with a ring, which swells and hinders them from separating. When the females are about to bring forth, they search for a concealed place in the inmost recesses of the forest. After

* See article Dog.

† Aristotle tells us, that the neck of the wolf consists of one continued bone. But this is a mistake; for the wolf's neck is composed of vertebræ, and is equally flexible as that of the dog.

fixing on the spot, they make it smooth and plain for a considerable space, by cutting and tearing up with their teeth all the brambles and brushwood. They then bring great quantities of moss, and prepare a commodious bed for their young, which are generally five or six, though sometimes they bring forth seven, eight, and even nine, but never less than three. They come into the world blind, like the dogs; the mother suckles them some weeks, and soon learns them to eat flesh, which she prepares for them by tearing it into small pieces. Some time after, she brings them field mice, young hares, partridges, and living fowls. The young wolves begin by playing with these animals, and at last worry them; then the mother pulls off the feathers, tears them in pieces, and gives a part to each of her young. They never leave their den till the end of six weeks or two months. They then follow their mother, who leads them to drink in the hollow trunk of a tree, or in some neighbouring pool. She conducts them back to the den, or, when any danger is apprehended, obliges them to conceal themselves elsewhere. Though, like other females, the she-wolf is naturally more timid than the male; yet, when her young are attacked, she defends them with intrepidity; she loses all sense of danger, and becomes perfectly furious. She never leaves them till their education is finished, till they are so strong as to need no assistance or protection, and have acquired talents fit for rapine, which gene-

rally happens ten or twelve months after their first teeth, which commonly fall out in the sixth month *, are replaced.

Both males and females are capable of generating at the age of two years. The females, it is probable, like those of other species, are sooner mature for this operation than the males. It is certain, however, that they never come in season before the second winter after birth, which implies eighteen or twenty months. A she-wolf, which I brought up, discovered no marks of love till the third winter, or more than two years and a half. We are assured by hunters †, that, in every litter, there are more males than females; which confirms the general remark, that, in every species, the number of males exceeds that of the females. They likewise tell us, that some males attach themselves to the females after the season of love is over, and accompany them till they are about to bring forth; that then the female steals off, and anxiously conceals her young, lest the father should devour them immediately after birth; but that, when brought forth, he takes an affection for them, supplies them with food, and, if deprived of their mother, provides for, and protects them himself. These facts, however, have the air of fiction, and seem contrary to the natural dispositions of the wolf ‡.

* See la Venerie de du Fouilloux, p. 100.

† See la Nouveau Traité de la Venerie, p. 276.

‡ These cares and attentions of the wolves for their young, are sometimes changed into the most deadly hatred: at least it

Wolves acquire their full growth at the end of two or three years, and live fifteen or twenty years. This fact accords with what we have already remarked concerning many other species, that the time of growth is the seventh part of the total duration of life. When old, wolves turn whitish, and their teeth are much worn. When full, or fatigued, they sleep, but more during the day than the night, and it is always a kind of slight slumber. They drink often; and, in the time of drought, when there is no water in the hollows, or in the trunks of old trees, they repair, several times in a day, to the brooks or rivulets. Though extremely voracious, if supplied with water, they can pass four or five days without meat *.

The wolf has great strength, especially in the anterior parts of the body, in the muscles of the neck and jaws. He carries a sheep in his mouth,

appears to be so with respect to those which Sonnini mentions, belonging to the menagerie of the Jardin des Plantes, at Paris. A female wolf, says Sonnini, which was confined with one of its own species, brought forth every year. One of the cubs was in the habit, occasionally, of creeping under the grating of the den, to play with the dogs of the menagerie. This good fellowship with the enemies of their race, offended both the father and the mother, who tore their cub in pieces, and then devoured it. The following year, the same thing took place, two or three cubs being devoured by their parents for a similar reason. *W.*

* Pennant says they are often so poor and hungry, for want of prey, as to go into a swamp and fill themselves with mud, which they will disgorge as soon as they get any food. *W.*

and, at the same time, outruns the shepherds; so that he can only be stopped or deprived of his prey by dogs. His bite is cruel, and always more obstinate in proportion to the smallness of the resistance; for, when an animal can defend itself, he is cautious and circumspect. He never fights but from necessity, and not from motives of courage. When wounded with a ball, he cries; and yet, when dispatching him with bludgeons, he complains not. He is harder, less sensible, and more robust than the dog. He runs and roams about whole days and nights; and, of all animals, he is perhaps the most difficult to conquer in the chase. The dog is gentle and courageous; the wolf, though ferocious, is timid. When he falls into a snare, he is so overcome with terror, that he may be either killed or taken alive, without resistance. He allows himself to be chained, muzzled, and led where you please, without exhibiting the least symptom oı resentment or discontent. The senses of the wolf are excellent, but particularly his sense of smelling, which often extends farther than his eye. The odour of carrion strikes him at the distance of more than a league. He likewise scents live animals very far, and hunts them a long time by following their tract. When he issues from the wood, he never loses the wind. He stops upon the borders of the forest, smells on all sides, and receives the emanations of living or dead animals brought to him from a distance by the wind. Though he prefers living to dead animals, yet he devours the most putrid carcasses.

He is fond of human flesh, and, were he stronger, he would perhaps eat no other. Wolves have been known to follow armies, to come in troops to the field of battle, where bodies are carelessly interred, to tear them up, and to devour them with an insatiable avidity: and, when once accustomed to human flesh, these wolves ever after attack men, prefer the shepherd to the flock, devour women, and carry off children *. Wolves of this vicious disposition are distinguished by the name of *loups garoux* †, or wolves that should be guarded against.

Whole countries are sometimes obliged to arm, in order to destroy the wolves. Princes have particular equipages for this species of hunting, which is both useful and necessary. Hunters distinguish wolves into *young*, *old*, and *very old*. They are known by the tracts of their feet. The older the wolf, the larger his feet. The she-wolf's feet are longer and more slender; her heel is also smaller, and her toes thinner. A good blood-hound is necessary for hunting the wolf; and, when he falls into the scent, he must be coaxed and encouraged; for all dogs have an aversion to the wolf, and proceed with coldness in the chase. When the wolf is raised, the greyhounds are let loose in pairs, and one is kept for

* If we look into the Saxon times, we find, that, in Athelstan's reign, wolves abounded so in Yorkshire, that a retreat was built at Flixton, in that county, *to defend passengers from the wolves, that they should not be devoured by them.*—Penn. Brit. Zool. i. p. 77. W.

† See la Chasse du Loup de Gaston Phœbus.

dislodging him, if he gets under cover; the other dogs are kept as a reserve. The first pair are let after the wolf, and are supported by a man on horseback; then the second pair are let loose at the distance of seven or eight hundred paces; and, lastly, the third pair, when the other dogs begin to join and teaze the wolf. The whole together soon reduce him to the last extremity; and the hunters complete the business by stabbing him with a dagger. The dogs have such a reluctance to the wolf's flesh, that it must be prepared and seasoned, before they will eat it. The wolf may also be hunted with beagles or hounds; but, as he darts always straight forward, and runs for a whole day without stopping, the chase is irksome, unless the beagles be supported by greyhounds, to teaze him, and give the hounds time to come up *.

In the country, though men, attended with mastiffs, beat the bushes, lay snares and baits, dig pits, and scatter poisoned pieces of meat; yet the number of these destructive animals never decreases, especially in woody countries. The British pretend to have cleared their island of this rapacious creature; and yet I am assured that wolves still exist in Scotland. As there is little

* In the year 1788, an enormous wolf was killed in the neighbourhood of Angouleme, in France. It was more than three feet high; was five feet and an inch long; and weighed 151 pounds: the teeth were of an enormous size, and its hair was of a deeper brown colour than usual.

W.

wood in the southern parts of Britain, it was a more easy task to extirpate the wolf.

It would appear, that these voracious creatures have found out new countries to inhabit. Pontoppidan alleges, that they existed not in Norway before the year 1718. He says, that during the last war between Sweden and Norway, the wolves passed the mountains by following the provisions of the army *.

Some English authors, who treat of British zoology, have reproached me for maintaining that wolves still exist in the northern parts of their island. I do not affirm this as a fact, but only say that I was assured that wolves "still existed in Scotland." Lord Morton, late president of the Royal Society, a Scotsman worthy of the greatest credit and respect, and proprietor of large territories in that country, assured me of this fact in the year 1756. To his testimony I still adhere, because it is positive, and because the assertion of those who deny the fact, amounts to a negative evidence only †.

* Pontoppidan's Nat. Hist. of Norway.

† It is amusing to see the count de Buffon, notwithstanding the repeated assurances he has had to the contrary, still maintaining that there are wolves in the north of Scotland. He appeals to the evidence of the late earl of Morton. We are fully disposed to give due weight to an authority so respectable, and so worthy of credit. But we are convinced that the count has misapprehended his lordship; for it is universally known to the inhabitants of Scotland, that not a single wolf has been seen in any part of that country for more than a century past.

The hair and colour of these animals vary with the climate, and sometimes even in the same country. In France and Germany, beside the common wolves, we find some with thicker and more yellow-coloured hair. These wolves, more wild, though less destructive, than the other kind, never trouble the flocks or the habitations of men, and live solely by hunting. In the northern countries, we meet with some wolves which are entirely white, and others entirely black; and the latter are larger and stronger than the former *. The common species are very generally diffused: they are found in Asia †, Africa ‡, and America §, as well as in Europe. The wolves of Senegal ‖ resemble those of France; but they are larger and more rapacious. The wolves of Egypt ¶ are smaller than those of Greece. In the east, and particularly in Persia, wolves are exhibited as spectacles to the people.

The last wolf was killed by the hand of sir Ewin Cameron about the year 1680. *W.*

* The wolves towards Hudson's Bay are of different colours, gray and white, and some black and white, the black hairs being mixed with the white chiefly along the back. They are taken in log-traps, or by spring-guns; their skins being an article of commerce. — *Penn. Arct. Zool.* *W.*

† See le Voyage de Pietro della Valle, vol. iv. p. 4.

‡ Hist. Gen. des Voyages, par M. l'Abbé Prevôt, tom. v. p. 85.

§ Le Voyage du Le Clercq, p. 488.

‖ Hist. Gen. des Voyages, tom. iii. p. 285. Voyage de le Maire aux Isles Canaries, Cap Verd, &c., p. 100.

¶ Arist. Hist. Animal. lib. viii. cap. 28.

When young, they are taught to dance, or rather to perform a kind of wrestling with a number of men. Chardin tells us, that a wolf well educated in dancing, is sold at 500 French crowns. This fact proves, that these animals, by time and restraint, are susceptible of some kind of education. I have brought up several of them. When young, or during their first year, they are very docile, and even caressing; and if well fed, they neither disturb the poultry nor any other animal. But at the age of eighteen months or two years, their natural ferocity returns, and they must be chained to prevent them from running off, and doing mischief. I reared one till the age of eighteen or nineteen months, in a court along with fowls, none of which he ever attacked; but, for his first essay, he killed the whole in one night, without eating any of them. Another, having broken his chain, run off, after killing a dog with whom he had lived in great familarity. I kept a she-wolf three years in a large court; and, though shut up, when very young, along with a mastiff dog of the same age, she would never suffer him to approach, even when she came in season. She provoked, she attacked, she bit the dog, who at first only defended himself, but at last he worried her *.

* Valmont de Bomarre tells us, that he brought up a young wolf, which he used to take into bed with him. The little animal would fondle his master, obey his voice, and come, like a dog, when he was called. He had been nourished only with milk and soup, till one day Bomarre gave him the guts of a chicken: he appeared never to have so good an

There is nothing valuable in the wolf but his skin, which makes a warm, durable fur. His flesh is so bad, that it is rejected with abhorrence by all other quadrupeds; and no animal but a wolf will voluntarily eat a wolf. The smell of his breath is exceedingly offensive. As, to appease hunger, he swallows indiscriminately every thing he can find, corrupted flesh, bones, hair, skins half tanned and covered with lime, he vomits frequently, and empties himself oftener than he fills. In fine, the wolf is consummately disagreeable; his aspect is base and savage, his voice dreadful, his odour insupportable, his disposition perverse, his manners ferocious; odious and destructive when living, and, when dead, he is almost perfectly useless.

The viscount of Querhöent, in his observations, tells us, that there are two species of wolves at the Cape of Good Hope, the one black, and the other gray, with black spots. He adds, that they are stronger than those of Europe, and their skin is thicker, and their teeth more sanguinary; but that their dastardliness makes them less formidable, though, like the ounces, they sometimes, during the night, come into the streets of the city *.

appetite; he redoubled his caresses; but his master soon repented having excited in the animal his natural relish for flesh: on the following night he awoke in pain, and found the young wolf sucking the blood from a wound he had just made in his thigh. *W.*

* The reader will immediately perceive that the viscount alludes to the hyæna. *W.*

THE BLACK WOLF*.

I DESCRIBE this animal only as a supplement to the article *Wolf*; for both, I am persuaded, belong to the same species. In the history of the wolf †, it was remarked, that, in the north of Europe, there are some wolves which are white, and the others black, and that the black kind are the largest. The wolf represented in the plate was brought from Canada. It was totally black, but smaller than our wolf: its ears were somewhat larger, more erect, and at a greater distance from each other. The eyes were likewise a little smaller, and appeared to be more

* CHARACTER SPECIFICUS.

CANIS LYCAON. C. cauda recta, corpore toto nigro.—*Linn. Syst. Nat. Gmel.* i. p. 73. — *Erxleb. Mamm.* p. 156. —*Schreb.* iii. p. 353, pl. 89.

LUPO NERO. — *Aless. Quadr.* i. p. 24.

LOUP NOIR. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 68, pl. 4.

BLACK WOLF. — *Shaw's Gen. Zool.* i. p. 297.

HABITAT

in Europæ, Asiæ, et Americæ frigidioribus.

W.

† See p. 163.

Plate 82

BLACK WOLF.

distant from one another, than in the common wolf. These differences, in my opinion, are too inconsiderable to constitute a distinct species. The greatest difference is that of the size. But, as I have oftener than once remarked, all the animals common to the northern parts of Europe and America differ in size; and the black wolf of Canada, which is smaller than those of Europe, only tends to confirm the general fact. Besides, as he had been taken when very young, and ever afterwards confined with a chain, constraint alone was perhaps sufficient to prevent him from acquiring his full growth. The common wolf is also smaller and less numerous in Canada than in Europe, and the savages esteem it for its skin *. The black wolf, the lynx, and the fox, are very numerous in North America; and yet the black fox is very rare, and his skin is much more beautiful than that of the black wolf, which makes but a very coarse fur.

I shall only add, that this black wolf resembled the common wolf, both in figure and dispositions; for he became rapacious only with age, and, like the wolf, he was ferocious without courage.

* Voyage de Saggard Theodat, p. 307.

THE MEXICAN WOLF*.

AS the wolf is a native of cold climates, he must have passed into America by the northern lands, being found equally in both continents.

* CHARACTER SPECIFICUS.

CANIS MEXICANUS. C. cauda deflexa lævi, corpore cinereo fasciis fuscis maculisque fulvis variegato.—*Linn. Syst. Nat. Gmel.* i. p. 71.

Canis cinereous, maculis fulvis variegatis.—*Briss. Quadr.* p. 237.

QUANTEPECOTLI sive felis montana Americana.—*Seb. Mus.* i. p. 68, t. 42, f. 2.

LE LOUP DU MEXIQUE.—*Buff. Hist. Nat. par Sonn.* xxvii. p. 71.

MEXICAN WOLF.—*Penn. Hist. Quadr.* i. p. 250.—*Shaw's Gen. Zool.* i. p. 278.

HABITAT

in calididioribus regni Mexicani.

W.

Wolf with a very large head; great jaws; vast teeth; on the upper lips very strong bristles, reflected backwards, not unlike the softer spines of a porcupine; and of a gray and white colour; large erect cinereous ears; the space between marked with broad tawny spots: the head ash-coloured, striped transversely with bending dusky lines; neck fat and thick, covered with a loose skin, marked with a long tawny

We have mentioned black and gray wolves in North America. It appears that this species is diffused as far as New Spain and Mexico; and that, in this warm climate, it has undergone some alterations, without changing its nature or dispositions; for the Mexican wolf has the same figure, appetites, and habits, as the European or North American wolf; and all of them appear to be the same species. The Mexican wolf, or rather the wolf of New Spain, where he is more common than in Mexico, has five toes on the fore-feet, and four on those behind. The ears are long and erect; and the eyes sparkle like those of our wolf. But the head is twice as large, the neck thicker, and the tail less bushy. Above the mouth, there are some bristles as large, but not so stiff, as those of the hedge-hog. Upon an ash-coloured ground, the body is marked with some yellow spots. The head is of the same colour with the body, and marked with transverse brownish lines, and the front is spotted with yellow. The ears are gray, like the head and body. There is a long yellow spot on the neck, another on the breast, and a third on the belly. On the flanks are transverse bands from the back to the belly. The tail is gray, with a

stroke: on the breast is another of the same kind: body ash-coloured, spotted with black; and the sides striped, from the back downwards, with the same colour; belly cinereous; tail long, of the colour of the belly, tinged in the middle with tawny; legs and feet striped with black and ash-colour: sometimes this variety is found white. — *Penn. Synops. Quadr.* p. 151.

yellow spot in the middle. The legs are barred with gray and brown. This is the most beautiful of all wolves, and its skin should be esteemed for its variety of colours *. But nothing indicates it to be a different species from the common kind, which varies from gray to white, from white to black, and a mixture of both, without changing its species: and we learn from Fernandes, that these wolves of New Spain vary like the European wolf; for, even in this country, they are not all marked according to our description, some of them being of a uniform colour, and even totally white †.

* It might be supposed, on account of the variety of colours, that the Mexican wolf is a lynx, which, like the wolf, is found in both continents. But a bare inspection of the figure given by Recchi will show, that it has a perfect resemblance to the wolf, and none at all to the lynx.

† Cuetlachtli, seu lupus Indicus Jo. Fabri. Xoloitscuintli. Forma, colore, moribus, et mole corporis lupo nostrati similis est, atque adeo ejus (ut mihi quidem videtur) speciei, sed ampliori capite. Tauros vero sicut et nostras lupus aggreditur, et interdum etiam homines; reperiuntur nonnulli candentes. ——Vivit in calidis Novæ Hispaniæ locis. — *Fernand. Hist. Anim. Nov. Hisp.* p. 7.

1704

Plate 83

FOX

THE FOX*.

THE fox is famous for craftiness; and he merits, in some measure, the reputation he has acquired. What the wolf executes by force alone, the fox performs by address, and often with more success. Without combating dogs

* CHARACTER SPECIFICUS.

CANIS VULPES. C. cauda recta, apice albo. — *Linn. Syst. Nat. Gmel.* i. p. 73. — *Erxleb. Mam.* p. 561. — *Schreber.* iii. p. 354, pl. 90.

VULPES. — *Gesn. Quadr.* p. 966. — *Aldrov.* p. 195. — *Jonst. Quadr.* p. 82. — *Ray's Quadr.* p. 177.

FUCHS. — *Ridinger*, pl. 14.

LE RENARD. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 313.

FOX. — *Penn. Hist. Quadr.* i. p. 251. — *Arctic Zool.* i. No. 11. — *Brit. Zool.* i. No. 11. — *Shaw's Gen. Zool.* i. p. 314.

HABITAT

in Europa, Africa, Asia boreali et Australi.

W.

Dog with a sharp nose, lively hazel eyes, sharp erect ears, body tawny red, mixed with ash-colour; fore part of the legs black; tail long, straight, bushy, tipt with white; subject to much variety in colour. — *Penn. Synop. Quadr.* p. 152.

In Greek, Αλωπηξ; in Latin, *Vulpes;* in Italian, *Volpe;* in Spanish, *Raposa;* in German, *Fuchss;* in Swedish, *Raef;* in Polish, *Liszka;* in French, *Le Renard.*

or shepherds, without attacking the flocks, or disinterring the bodies of the dead, the fox is more certain of procuring his food. He exerts more genius than motion, and all his resources are within himself. Acute as well as circumspect, ingenious, and patiently prudent, he diversifies his conduct, and always reserves some art for unforeseen accidents. Of his own preservation he is extremely vigilant. Though equally indefatigable, and even nimbler than the wolf, he trusts not entirely to the swiftness of his course. The fox knows how to insure safety, by providing himself with an asylum, where he retires from pressing dangers, where he dwells, and where he brings up his young. He is not a vagabond, but lives in a settled domestic state.

This difference, though it appears even among men, has greater effects, and supposes more powerful causes, among the inferior animals. The single idea of a house, or settled place of abode, indicates a singular attention to self. The choice of situation, the art of making and rendering a house commodious, and of concealing the avenues to it, imply a superior degree of sentiment. The fox is endowed with this quality, and manages it with advantage. He fixes his abode on the border of the wood, in the neighbourhood of cottages: he listens to the crowing of the cocks, and the cries of the poultry. He scents them at a distance; he chooses his time with judgment; he conceals his road, as well as his design; he slips forward with caution, sometimes even trailing his body, and seldom makes

a fruitless expedition. If he can leap the wall, or get in underneath, he ravages the court-yard, puts all to death, and then retires softly with his prey, which he either hides under the herbage, or carries off to his kennel. He returns in a few minutes for another, which he carries off, or conceals in the same manner, but in a different place. In this way he proceeds till the progress of the sun, or some movements perceived in the house, advertise him that it is time to suspend his operations, and to retire to his den. He plays the same game with the catchers of thrushes, woodcocks, &c. He visits the nets and bird-lime very early in the morning, carries off successively the birds which are entangled, and lays them in different places, especially near the sides of highways, in the furrows, under the herbage or brushwood, where they sometimes lie two or three days; but he knows perfectly where to find them, when he is in need. He hunts the young hares in the plains, seizes old ones in their seats, never misses those which are wounded, digs out the rabbits in the warrens, discovers the nests of partridges and quails, seizes the mothers on the eggs, and destroys a vast quantity of game. The wolf is not more noxious to the peasant, than the fox to the gentleman.

The chase of the fox requires less apparatus, and is more amusing, than that of the wolf. To the latter, every dog has great reluctance; but all dogs hunt the fox spontaneously, and with pleasure; for, though his odour be strong, they often prefer him to the stag or the hare. He may be

hunted with terriers, hounds, &c. Whenever he finds himself pursued, he runs to his hole; the terriers with crooked legs, or turnspits, go in with most ease. This mode answers very well when we want to carry off a whole litter of foxes, both mother and young. While the mother defends herself against the terriers, the hunters remove the earth above, and either kill or seize her alive. But, as the holes are often under rocks, the roots of trees, or sunk too deep in the ground, this method is frequently unsuccessful. The most certain and most common method of hunting foxes, is to begin with shutting up their hole, to place a man with a gun near the entrance, and then to search about with the dogs. When they fall in with him, he immediately makes for his hole; but, when he comes up to it, he is met with a discharge from the gun. If he escapes the shot, he flies with full speed, takes a large circuit, and returns again to the hole, where he is fired upon a second time; but, finding the entrance shut, he now endeavours to escape by darting straight forward, with the design of never revisiting his former habitation. He is then pursued by the hounds, whom he seldom fails to fatigue, because he purposely passes through the thickest parts of the forest, or places of the most difficult access, where the dogs are hardly able to follow him; and, when he takes to the plains, he runs straight out, without stopping or doubling.

But the most effectual mode of destroying foxes, is the laying of snares baited with a pigeon, a live fowl, &c. I once suspended on a tree, at

the height of nine feet, some meat, bread, and bones. The foxes had been at severe exercise during the night; for, next morning, the earth all around was beaten, by their jumping, as smooth as a barn-floor. The fox is exceedingly voracious; beside flesh of all kinds, he eats, with equal avidity, eggs, milk, cheese, fruits, and particularly grapes. When the young hares and partridges fail him, he makes war against rats, field-mice, serpents, lizards, toads, &c. Of these he destroys vast numbers; and this is the only service he does to mankind. He is so fond of honey, that he attacks the wild bees, wasps, and hornets. They at first put him to flight by a thousand stings: but he retires only for the purpose of rolling himself on the ground to crush them; and he returns so often to the charge, that he obliges them to abandon the hive, which he soon uncovers, and devours both the honey and wax. In a word, he eats fishes, lobsters, grasshoppers, &c.

The fox has a great resemblance to the dog, especially in his internal parts. His head, however, is larger in proportion to his body; his ears are also shorter, his tail thicker, his hair longer and more bushy, and his eyes more inclined. He differs still more from the dog by a strong offensive odour which is peculiar to him*,

* "The smell of the fox is proverbially offensive. This smell, as in many other quadrupeds, proceeds, perhaps, from certain glands seated near the tail; but there is an observation in the Systema Naturæ of Linnæus, which at first appears in the highest degree paradoxical; *viz.* that the fox diffuses

and by his natural disposition; for he is not easily, and never fully tamed: he languishes when deprived of liberty, and if kept too long in a domestic state, he dies of chagrin. He does not copulate with the female dog *: if they have no rooted antipathy, they are at least indifferent to each other. Foxes produce but once a year, and the litter commonly consists of four or five, seldom six, and never less than three. When the female is full, she retires, and seldom goes out of her hole, where she prepares a bed for her young. She comes in season in the winter; and young foxes are found in the month of April. When she perceives that her retreat is discovered, and that her young have been disturbed, she carries them off one by one, and goes in search of another habitation. The young are brought forth blind; like the dogs, they grow eighteen months, or two years, and live thirteen or fourteen years.

an ambrosial odour from the upper part of the tail (*Ambrosiaco fragrat odore supra cauda basin*). This observation is also made by Mr. Schreber, in his History of Quadrupeds. This smell, says he, of the fox, is strong and unpleasant, but on the tail is a spot from which proceeds a violaceous scent. This strange peculiarity seems to have been first published by Doebel, in his work on hunting. The offensive or general smell of the fox is supposed exactly to resemble that of the root of the crown imperial (Fritillaria Imperialis, Linn). This is mentioned by Dr. Grew, in his Anatomy of Vegetables, where he assures us, that the root of this plant, being rubbed a little, smells as like a fox, as one fox smelleth like another." —*Shaw's Gen. Zool.* i. p. 318. *W.*

* See my experiments on this subject, article Dog.

The senses of the fox are equally good as those of the wolf; his sentiment is more delicate; and the organs of his voice are more pliant and perfect. The wolf sends forth only frightful howlings; but the fox barks, yelps, and utters a mournful cry like that of the peacock. He varies his tones, according to the different sentiments with which he is affected: he has an accent peculiar to the chase, the tone of desire, of complaint, and of sorrow. He has another cry expressive of acute pain, which he utters only when he is shot, or has some of his members broken; for he never complains of any other wound, and, like the wolf, allows himself to be killed with a bludgeon without complaining; but he always defends himself to the last with great courage and bravery. His bite is obstinate and dangerous; and the severest blows will hardly make him quit his hold. His yelping is a species of barking, and consists of a quick succession of similar tones; at the end of which he generally raises his voice, similar to the cry of the peacock. In winter, and particularly during frost and snow, he yelps perpetually; but, in summer, he is almost entirely silent, and, during this season, he casts his hair. The skins of young foxes, and of those taken in summer, are of little value. The flesh of the fox is not so bad as that of the wolf: dogs, and even men eat it in autumn, especially when he has been fattened with grapes; and his skin, in winter makes excellent furs. He sleeps sound, and may be easily approached without

wakening: he sleeps in a round form, like the dog; but, when he only reposes himself, he extends his hind-legs, and lies on his belly. It is in this situation that he spies the birds along the hedges, who have such an antipathy to him, that they no sooner perceive him, than they send forth soft shrill cries to advertise their neighbours of the enemy's approach. The jays and blackbirds, particularly, follow the fox from tree to tree, sometimes two or three hundred paces, often repeating the watch-cries.

I brought up some young foxes: their offensive odour made it necessary to keep them in stables, or places which were not much frequented. This, perhaps, might be one reason why they were less tame than the wolf, which was kept near the house. At the age of five or six months, the young foxes pursued the ducks and fowls; and, therefore, it became necessary to chain them. I kept two males and a female two years. I tried in vain to make the males copulate with bitches: though they had never seen females of their own species, and were stimulated by the strongest desires of Nature, they uniformly rejected the bitches: but, whenever a she-fox was presented to them, though chained, they instantly covered her, and she brought forth four whelps. The young foxes, who, when at liberty, had darted on the poultry, never attempted to touch a single fowl, after they were chained. A living hen was generally fixed near them for a whole night; and, though victuals were kept from them for many

Plate 83 A

Warner Sc.

WHITE FOX.

hours, yet, in spite of hunger and of opportunity, they never forgot that they were chained, and disturbed not the hen.

The fox is so extremely subjected to the influence of climate, that the varieties of this species are almost as numerous as those of the domestic animals. Most of our foxes are reddish; but some of them are of a silver gray: in both, the end of the tail is white. In Burgundy, the latter are called *coal foxes;* because their feet are remarkably black. Their bodies have also the appearance of being shorter, because they are better clad with hair. There are some who are really longer than the other kinds, and of a dirty gray colour, nearly the same with that of old wolves. But it is uncertain whether this difference constitutes a real variety, or is produced by the age of the animal, who, perhaps, grows whiter as he advances in years. In the northern regions, the foxes are of all colours, black, blue, gray, iron-coloured, silver gray, white, white with yellow feet, white with black heads, white with the extremity of the tail black, reddish with the throat and belly entirely white; and, lastly, some of them have a black line along the spine, crossed with another black line over the shoulder. The latter are larger than the other kinds, and have black throats. The common species are more generally diffused than any of the others. We find them in every part of Europe *, in the northern and temperate regions

* See les Œuvres de Renard, tom. i. p 175.

of Asia *, and in America †; but they are very rare in Africa, and in the countries bordering on the equator. Travellers, who pretend to have seen them in Calicut ‡, and other southern provinces of India, have mistaken the jackal for the fox. Aristotle himself falls into a similar error, when he tells us §, that the foxes of Egypt are smaller than those of Greece; for what he calls the small foxes of Egypt are polecats ‖, whose odour is intolerable. Our foxes, which belong originally to cold climates, have spread over all the temperate regions, but have never penetrated farther south than Spain and Japan ¶. What shows them to be natives of cold countries is, that all the varieties of the species are to be found in the high latitudes, and no where else: besides, they support with ease the most extreme cold, and live in the neighbourhood of both poles **. The fur of the white foxes is not much valued, because the hairs fall easily off; the silver gray is better; and the blue and cross kinds are in great request, on account of their rarity; but the black is the most precious; next to that of the sable, it is the best and dearest fur.

* Voyage d'Olearius, tom. i. p. 368.

† Voyage de la Hontan, tom ii. p. 42.

‡ Voyage de Pyrard, tom i. p. 427.

§ Arist. Hist. Animal. lib. viii. cap. 18.

‖ Aldrovand. Quadrup. Hist. p. 197.

¶ L'Hist. du Japon, par Koempfer, tom i. p. 110.

** Narborough's Voyage to the South Seas; Coreal, tom. ii. p. 184; Recueil des Voyages du Nord, tom. ii. p. 113; Recueil des Voyages qui ont servi à l'Etablissement de la Comp. des Indes Orient. tom. i. p. 39.

We find foxes in Spitzbergen *, in Greenland, in Lapland †, and in Canada ‡. In the latter country, there are likewise crossed foxes; the common species is not so red as in Europe; and the hair is longer and more bushy.

Travellers inform us, that the foxes of Greenland resemble dogs in the form of the head and feet, and likewise in their barking; that some of them are white, but the greatest number gray or blue; that they seldom change their colour, and, when the hair of the blue kind begins to fall off, it grows pale, and the fur is no longer valuable; that they live upon eggs and birds, and, when they are unsuccessful in finding this species of food, they content themselves with flies, bees, crabs, and what they can procure by fishing; and that they dwell in the clefts of rocks §.

At Kamtschatka, the hair of the fox is very bushy, and so glossy and beautiful, that it excels the finest Siberian furs. The most valuable are the black chesnuts, those with black bellies and red bodies, and those of an iron colour ‖.

* Recueil des Voyages qui ont servi à l'Etablissement de la Comp. des Indes Orient. tom. i. p. 39.

† Foxes abound all over Lapland. They are generally white, though some of them are of the common colour. The white furs are less esteemed; but the black, which are more rare, are sometimes sold for forty or fifty French crowns; the hair is so fine and so long, that it hangs on any side you please. — *Œuvres de Renard*, tom. i. p. 175.

‡ Voyages du Pays des Hurons, par Sagard Theodat. p. 304.

§ Hist. Gen. des Voyages, tom. xix. p. 38.

‖ Id. ibid. p. 252.

In Norway there are white, bay, and black foxes, and others which have two black lines on the reins. The latter kind, and those which are wholly black, are most esteemed. These furs are a considerable article of commerce: from the port of Bergen alone, more than 4,000 foxes' skins are annually exported. Pontoppidan, who often indulges in the marvellous, tells us, that a fox had ranked several heads of fishes into rows, at some distance from a fisher's hut; that the people could not imagine what might be his intention, but that, a little afterwards, a crow, which lighted to feed upon the heads, fell a sacrifice to his cunning device. He adds, that these animals make use of their tail in catching lobsters, &c. *

We may presume that the species of fox, of which we have noticed several varieties, is spread from pole to pole; for voyagers have remarked animals under this name, at Spitzbergen, and Terra del Feugo, as well as at the Malouines. Captain Phipps relates that they found foxes on Spitzberg, and the adjacent islands: that it is true, they were not numerous; and, that, independent of their colour, which is white, they differed from our fox in their ears, which are much rounder, and in having very little smell: he adds, that he ate of the flesh of these animals, and found it palatable †.

M. de Bougainville informs us, that he found only one species of quadruped in the Malouine,

* Pontoppidan's Nat. Hist. of Norway.

† Phipps's Voyage.

or Falkland islands; and that this species applied to that of the wolf and the fox. This animal digs a burrow; its tail is longer and more hairy than that of the wolf: it inhabits the downs close to the sea: it follows the birds, which are very numerous in these islands: it has the sense always to go from one bay to another by the shortest road: it is as large as a common sized dog, of which it also has the bark, but weak: it destroys abundance of eggs and young birds *. These indications are not sufficient to decide if the animals to the north of our continent are the same as those of South America and the Falkland islands; but, having received two specimens of these animals from the Falkland islands; and, having carefully compared them with the European foxes, we have discovered that they are absolutely of the same species. It is the same with the white fox, which we have figured, and which is probably of the same race as the white Spitzbergen foxes, mentioned by captain Phipps.

The skin of this animal was shown me by M. Villemarais, to whom I owe also the observations on the genettes of France, which, he says, come from the north. It measures one foot ten inches six lines from the end of the muzzle to the origin of the tail: the height from the shoulder is one foot nine lines; from the hind quarter, one foot, an inch, and four lines.

* Voyage autour du Monde, 8vo. tom. i. p. 113.

It differs somewhat from the foxes of temperate countries in the hair, which is very long on the body, thighs, and legs. Its ears are smaller: the distance of the eye from the ear is very considerable; the end of the nose and the nostrils are reddish. The hairs on the back are two inches long; those on the flanks, the belly, and the thighs, are two inches nine lines: beneath these hairs, there is a very soft and tufted down or fur of a yellowish-white colour. The whiskers are white, and measure one inch ten lines: the tail is one foot two inches and eight lines long; the trunk measures one foot eight lines. This tail is thick and hairy throughout. The nails are almost all of a size; they are white and crooked *.

* Pallas, in his northern travels, says, that the white foxes of the north are brown in summer, and when they come into the world. When the cubs begin to leave their burrows at the end of August, their back only is brown, their flanks are white, and they are then called *morniki*. By the middle of September, the old ones have acquired their winter coat, and have only a brown, cruciform stripe, and are then named *krestovatiki*. They are almost entirely white in October, having only some brown spots on the back. They then bear the name of *tchaieschniki*, and that of *siniaki* if these spots are gray. *W.*

Plate 84

BADGER

THE BADGER*.

THE badger is an indolent, diffident, solitary animal. He retires to the most secret places, to the inmost recesses of the forest, and there digs a

* CHARACTER SPECIFICUS †.

URSUS MELES. U. cauda concolore, corpore supra cinereo, subtus nigro fascia longitudinali per oculos auresque nigra. — *Linn. Syst. Nat. Gmel.* i. p. 102. — *Schreb.* iii. p. 516, pl. 142, — *Erxleb. Mamm.* p. 151.

Meles pilis ex sordide albo et nigro variegatis vestita, capite tæniis alternatim albis et nigris variegata. — *Briss. Quadr.* p. 183.

MELES. — *Gesn. Quadr.* p. 687, fig. p. 686.

TAXUS. — *Aldrov.* p. 263, fig. p. 267. — *Jonst. Quadr.* p. 146, t. 63. — *Klein. Quadr.* p. 73. — *Ray's Quadr.* p. 185.

LE BLAIREAU. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 334, pl. 14.

BADGER. — *Penn. Hist. Quadr.* ii. p. 14. — *Brit. Zool.* i. No. 13, pl. 8. — *Bew. Quadr.* p. 254. — *Shaw's Gen. Zool.* i. p. 467, pl. 106.

HABITAT

in Europa, Asia boreali, usque in Sinam et ad mare caspium; in sylvis umbrosis, depressis, lapidosis.

W.

The badger has six cutting teeth, and two canine in each

† For the generic character, see the *Bear* (Ursus Arctos).

subterranean habitation. He seems to fly society, and even the light, and spends three fourths of life in his dark abode, from which he never departs but in quest of subsistence. As his body is long, his legs short, his claws, especially those of the fore-feet, very long and strong, he digs and penetrates the earth with greater facility than any other animal. He makes his hole winding and oblique. The fox, who cannot dig with equal dexterity, avails himself of the operations of the badger: being unable to make him quit his habitation by force, the fox practises every art to render him uneasy: he stands sentinel at the entrance of the hole, and even defiles it with his ordure. He afterwards takes possession, enlarges, and fits it up for his own accommodation. The badger, though obliged to change his habitation, leaves not his country. He goes to a

jaw; five toes before, five behind, with very long straight claws on the fore-feet; and a transverse orifice between the tail and the anus. He has small eyes, short rounded ears, a short thick neck, with nose, chin, lower sides of the cheeks, and middle of the forehead, white; ears and eyes inclosed in a pyramidal bed of black; hairs on the body long and rude, their bottoms a yellowish-white, middle black, ends ash-coloured; throat, breast, belly, and legs black; tail covered with long hairs, coloured like those of the body; legs very short and thick; claws on the fore-feet very long; a fetid white matter exudes from the orifice beneath the tail; an animal of a very clumsy make.—*Penn. Synop. Quadr.* p. 201.

In Latin, *Meles, Taxus*; in Italian, *Tasso*; in Spanish, *Tasugo, Texon*; in German, *Tachs, Dachs, Dax*; in Swedish, *Grafswin*; in Polish, *Jazwiec, Borsuc, Kol-dziki, Zbik*; in French, *le Blaireau ou Taisson.*

small distance only, where he digs a fresh hole, from which he removes not, except in the night; and, as he never goes far, he returns upon the approach of danger. This is his only mean of safety; for he cannot escape by flight: his legs are too short for quick motion. When at some distance from his hole, he is soon overtaken by the dogs. They seldom, however, accomplish their purpose without assistance. The hair of the badger is very thick, and his legs, jaws, teeth, and claws, are exceedingly strong. These natural weapons he uses with courage and dexterity: he lies on his back, resists all the efforts of the dogs, and wounds them in the most dangerous manner. He is, besides, very tenacious of life, fights long, makes a brave defence, and persists to the very last extremity.

Formerly, when badgers were more common, terriers were trained to hunt and to take them in their holes. The badger defends himself by retiring and throwing back the earth, in order to stop or bury the dogs. He can only be taken by opening the hole above, after the dogs have pushed him to its extremity. The people lay hold of him with pincers, and then muzzle him, to prevent his biting. I have kept some of them, which had been taken in this manner, a considerable time. The young ones are easily tamed; they play with the dogs, and follow the person who feeds them. But, when taken old, they continue always savage. They are neither mischievous nor ravenous, like the wolf and fox; and yet they are carnivorous. They eat every

thing presented to them, as flesh, eggs, cheese, butter, bread, fish, fruit, nuts, grain, roots, &c. But raw flesh they prefer to every other food. They sleep the whole night and three fourths of the day; and yet they are subject to a lethargic or benumbed state during winter, like the marmottes or dormice. This great quantity of sleep makes them fat, though they eat but little; and, for the same reason, they can support hunger with ease, and often remain in their holes three or four days together, especially during snow.

They keep their habitations extremely clean, and never defile them with their ordure. The male is seldom found with the female. When about to bring forth, she cuts down the herbage, bundles it up, and trails it with her feet to the bottom of the hole, where she makes a commodious bed for herself and her young. She brings forth in summer; and the litter commonly consists of three or four. When somewhat advanced, she brings them victuals. She now travels in the night to greater distances than formerly. She uncovers the earth from bee-hives, and carries off the honey; she rushes into the burrows of rabbits, and seizes their young; she likewise lays hold of field-mice, lizards, serpents, grasshoppers, and birds' eggs, which she conveys to her offspring, whom she often leads to the mouth of the hole, in order to suckle or to feed them.

These animals are naturally chilly: those brought up in the house would never quit the corner of the fire, and often approach so near as

to burn their feet, which do not readily heal. They are subject to the itch, and often infect the dogs which enter their holes, unless they be afterwards carefully washed. The hair of the badger is always rude and greasy. Between the anus and tail, there is a pretty large fissure, penetrating about an inch deep, from which continually exudes an unctuous ill-scented liquor, which the animal is fond of sucking. The flesh of the badger has not a very bad taste; and coarse furs, collars for dogs, coverings for horses, &c., are made of his skin.

We know of no varieties in this species: we have endeavoured, without success, to find the sow-badger, spoken of by hunters. Du Fouilloux* tells us, that there are two species of badgers, the sow and the dog-badger; and that the sow-badger is fatter, whiter, and grosser, both in the body and head, than the dog-badger. These differences are extremely trivial; and he acknowledges, that they are not to be perceived without an accurate inspection†. This distinction I consider as a vulgar error, probably founded on the double name of this animal, both in Latin, viz. *meles* and *taxus*, and in French, viz. *blaireau* and *taisson*. Besides, those species which have varieties, are commonly very numerous and generally diffused: that of the badger, on the contrary, is one of the least numerous, and most

* La Venerie de du Fouilloux, p. 72.

† Id. ibid.

limited. We are not certain that they exist in America, unless we regard as a variety the animal sent from New York, of which M. Brisson * has given a short description under the name of the *white badger*. There are none in Africa; for the animal from the Cape of Good Hope, described by Kolbe † under the name of the *stinking badger*, is a different species; and it is doubtful whether the *fossa* of Madagascar, mentioned by Flacourt, who says it resembled the French badger, be a real badger, or some other animal. It has never been taken notice of by other travellers: Dr. Shaw even says, that the badger is totally unknown in Barbary ‡. It seems likewise not to exist in Asia: it was not known to the Greeks; for Aristotle never mentions it, and the badger has no name in the Greek language. Hence this species of quadruped, an original native of the temperate climates of Europe, has

* Meles supra alba, infra ex alba flavicans. — The white badger, from the extremity of the muzzle to the origin of the tail, is one foot nine inches long, and the tail is nine inches in length. The eyes are proportionably small, the legs very short, and the claws white. The whole body is covered with very thick hair, white on the superior, and of a yellowish white on the inferior, part of the body. It is found in New York, from whence it was transported by M. de Reaumur. — *Briss. Regn. Ann.* p. 255. He should have added to this description, that it was smaller, and that its nose was shorter than our badger. Besides, we perceive not from the dried skin, whether it had the fissure or purse under the tail.

† Descript. du Cap, par Kolbe, tom. iii. p. 64.

‡ Shaw's Travels.

never spread beyond Spain, France, Italy, Germany, Britain, Poland, and Sweden *; and it is every where very scarce. The badger admits not only of no varieties, but he even approaches not to any other species. His characters are deeply marked, and very singular. The alternate belts upon his head, and the fissure under his tail, are perfectly peculiar; and his body is nearly white above, and almost black below, which is contrary to all other animals, whose bellies are always of a lighter colour than their backs.

* Pontoppidan mentions the badger in his Natural History of Norway, and Pallas says it is very common in the mountainous land that borders the Volga. It is also found on the banks of the Jaik. The Calmucks esteem them for their fat. This animal is also common in Siberia, where it is called *barssouki*; but as the skin is of little value, the inhabitants seldom kill it, except when they want its grease. — *Travels in Russia, French edition.* *W.*

THE OTTER*.

THE otter is a voracious animal, but fonder of fish than of flesh: he never quits the margins

* LUTRA.

CHARACTER GENERICUS.

Dentes primores sex, subacuti: *laniarii* longiores.
Molares plures quam tres.
Pedes palmati.

CHARACTER SPECIFICUS.

Lutra Vulgaris. L. plantis nudis, cauda corpore dimidio breviore.—*Erxleb.* p. 448.

Mustela Lutra. Plantis palmatis nudis, cauda corpore dimidio breviore.—*Linn. Syst. Nat. Gmel.* i. p. 93.—*Shcreber.* iii. p. 475, t. 126, A. B.

Lutra digitis æqualibus.—*Faun. Suec.* i. n. 10.

Lutra.—*Gesn. Quadr.* p. 775.—*Aldrov.* p. 292.—*Jonst. Quadr.* p. 150, pl. 68.—*Ray's Quadr.* p. 187.

Le Loutre.—*Buff. Hist. Nat. par Sonn.* xxiv. p. 346, pl. 16.

Otter.—*Penn. Hist. Quadr.* ii. p. 77.—*Shaw's Gen. Zool.* i. p. 437, pl. 100.

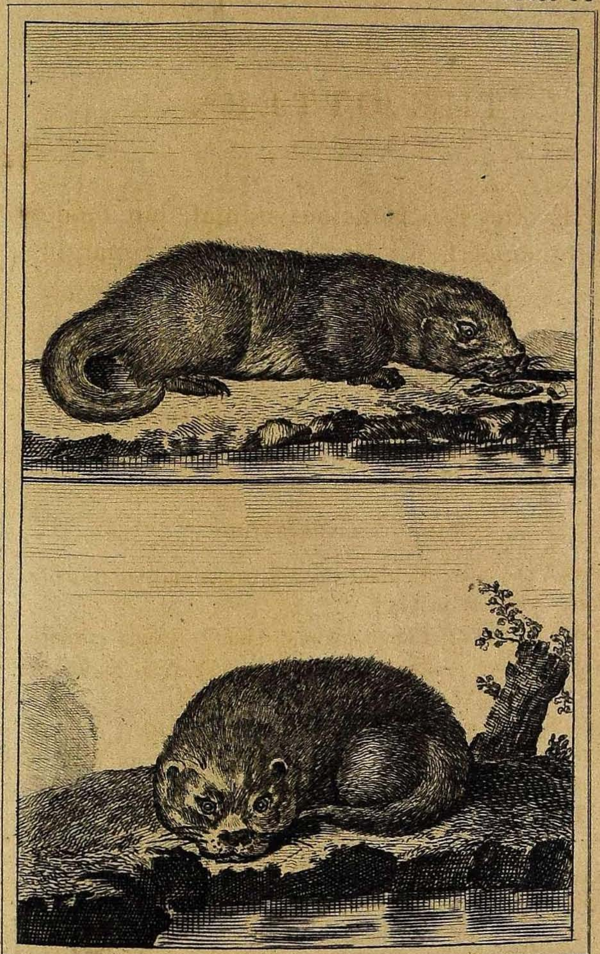
HABITAT

in Europæ atque Asiæ Americæque borealis aquis dulcibus, fluviis, stagnis, piscinis, non in mari.

W.

The otter has six cutting teeth, and two canine, in each

1192A



OTTER

of rivers or of lakes, and often depopulates the fish ponds. He swims with more ease than the beaver; for the latter has membranes on his hind-feet only, and the toes of his fore-feet are separate; but the otter has membranes on all his feet. He swims almost as quick as he walks. He never goes to the sea, like the beaver; but traverses the fresh waters and rivers to very considerable distances. He often swims under the water, and, after remaining pretty long, ascends to the surface for air. Properly speaking, he is not an amphibious animal, or an animal that can live equally in air and in water. He is not formed for continuing in the latter element; for, like other terrestrial creatures, he requires the aid of respiration. When in pursuit of a fish, if he chances to be entangled in a net, he drowns; and we perceive that he has not had time to cut a sufficient quantity of the meshes to effectuate his escape. His teeth resemble those of the martin,

jaw; five toes on each foot, each toe connected by a strong membrane. He has short ears, eyes placed near the nose, thick lips, and large whiskers. The whole colour of his body is of a deep brown, except two small spots on each side of the nose, and another below the chin: his legs are short, thick, loosely joined to the body, capable of being brought to a line with the body, and of performing the part of fins: each toe is connected to the other by a broad strong web. His length is twenty-three inches, and that of the tail sixteen. — *Penn. Synops. Quadr.* p. 238.

In Greek, Ενυδρις; in Latin, *Lutra, Lytra, Lutrix, Lutris*; in Italian, *Lodra, Lodria, Loutra*; in Spanish, *Nutria*; in German, *Fischotter*; in Swedish, *Witter*; in Polish, *Wydra*; in French, *La Loutre.*

but they are proportionally longer and stronger. For want of fishes, crabs, frogs, water-rats, or other food, he gnaws the young twigs, and eats the bark of aquatic trees; he likewise eats the young herbage in the spring. He is neither afraid of cold nor of moisture. The female comes in season in winter, brings forth in March, and the litter consists of three or four. Young animals are generally beautiful; but the young otter is not so handsome as the old. A head ill shaped, ears placed low, eyes small and covered, a lurid aspect, awkward motions, an ignoble and deformed figure, and a kind of mechanical cry, which he repeats every moment, seem to indicate a stupid animal. The otter, however, acquires industry with age, sufficient, at least, to carry on a successful war against the fishes, who, both with regard to sentiment and instinct, are much inferior to other animals. But I can hardly allow him to have the talents of the beaver, or even the habits ascribed to him, such as that of always ascending the rivers, in order to swim the more easily down the current, when loaded with his prey *; that of fitting up and flooring his house, to exclude the water; that of hoarding a store of fishes, in case of a scarcity; and, lastly, that of being easily tamed, of fishing for his master, and even bringing the fish into the kitchen. All I know is, that the otters dig no habitations for themselves; that they take possession of the first hole they find under the roots of poplars or

* See Gesner, Hist. Quadr. p. 685.

willows, in the clefts of rocks, and even in piles of floating wood; that they deposit their young on beds made of twigs and herbs; that we find in their habitations, heads and bones of fishes; that they often change their places of abode; that they banish their young at the end of six weeks or two months; that those I attempted to tame endeavoured to bite, though they were only taking milk, and unable to eat fish; that some days after they became more gentle, perhaps because they were weak or sick; that, so far from being easily accustomed to a domestic life, all of them which I attempted to bring up, died young *; that the otter is naturally of a savage and cruel disposition; that, when he gets into a fish pond, he is equally destructive as the pole-cat in a hen-house; that he kills many more fishes than he can eat, and then carries off one in his mouth.

Though the otter does not cast his hair, his skin is browner and sells dearer in winter than in summer; it makes a very fine fur. His flesh has a disagreeable, fishy taste †. His retreats ex-

* The count was afterwards convinced that the otter could be domesticated, and has published a letter from the marquis de Courtivron, in his sixth supplemental volume, respecting a tame otter that was kept in an abbey at Autun. Two instances are also mentioned by Mr. Bewick, of persons who had tame otters, which would follow them very readily, come when they were called, and assist them in catching fish.

W.

† The skin is greatly esteemed in cold countries for lining

hale a noxious odour, from the remains of putrid fishes; and his own body has a bad smell. The dogs chase the otter spontaneously, and easily apprehend him when at a distance from water, or from his hole. But, when seized, he defends himself, bites the dogs most cruelly, and sometimes with such force as to break their leg-bones, and never quits his hold till death looses his jaws. The beaver, however, which is not a very strong animal, pursues the otters, and permits them not to live upon the banks he possesses.

This species, though not very numerous, is spread over Europe from Sweden to Naples; and we find them even in North America*. They were well known to the Greeks†, and probably extend over all the temperate climates, especially in places which abound with water; for the otter can neither dwell in burning sands, nor in dry

cloaths; but in England it is only used for pistol furniture. The best furs of this kind come from the northern part of Europe and America. The Indians make the skins into pouches: the Budini, a people noticed by Herodotus, lined their garments with the otter's fur.

The flesh is extremely fishy and disagreeable. The Romish church permits the use of it on maigre days. In the kitchen of the Carthusian convent, near Dijon, Mr. Pennant saw one preparing for the dinner of the religious of that rigid order, who, by their rules, are prohibited, during their whole lives, the eating of flesh.—*Penn. Brit. Zool.*

W.

* See le Voyage de la Hontan, tom. ii. p. 38.

† See Arist. Hist. Anim. lib. viii. cap. 5.

deserts*. He equally flies barren rivers, and those that are too much frequented.

Pontoppidan assures us, that, in Norway, the otters frequent the salt as well as the fresh waters; and that they live among the fragments of rocks, from which the hunters decoy them by imitating their voice, which consists of a low kind of whistle. He adds, that they eat only the fatty parts of fishes; and that a tamed otter, which was fed with milk, brought fish daily to the house†.

I believe none of them are to be found in very warm countries; for the jiya or carigueibeju ‡, which is found at Cayenne §, and has been named the Brazilian otter, appears to be a different species ‖: whereas the North American otter resembles the European in every article,

* Pallas says, that in Siberia, the otters are either hunted with dogs, or killed with bows and arrows, which they place along the bank of the rivers. *W.*

† Pontop. Nat. Hist. of Norway.

‡ Jiya quæ et carigueibeju appellatur a Braziliensibus.—*Marcg. Hist. Brazil*, p. 234. Lutra Braziliensis.—*Ray's Synops. Anim. Quadr.* p. 189. Lutra pollice digitis breviore. —*Linn.* Lutra atri coloris, maculâ sub gutture flavâ.—*Briss. Regn. Anim.* p. 278.

§ Lutra nigricans, caudâ depressâ et glabrâ.—*Barrere, Hist. de la France Equinoxiale*, p. 155.

‖ Lutra Braziliana. L. atra, gutture flavo.—*Shaw's Gen. Zool.* i. p. 446.

Lutra nigricans, cauda depressa et plana.—*Barr. For. Equin.* p. 155.

Brazilian Otter.—*Penn. Hist. Quadr.* ii. p. 79.

W.

except that his fur is blacker and finer than that of the Swedish or Muscovite otter *.

In some notes communicated by M. de la Borde, I find that there are three species of otters in Cayenne; the black, which weighs forty or fifty pounds; the yellowish, which weighs twenty or twenty-five pounds; and the small grayish kind, which weighs not above three or four pounds. He farther remarks, that these animals are very frequent in Guiana, along the rivers and marshes where fishes abound: they sometimes appear in numerous troops, and are so fierce that they cannot be approached. Their bite is cruel, and they defend themselves against the dogs. They litter in holes, which they dig in the banks. They are often tamed and brought up in houses. I have remarked, says M. de la Borde, that all the animals of Guiana are easily accustomed to a domestic state, and become even troublesome by their familiarity.

M. Aublit, a learned botanist, formerly quoted, and M. Oliver, surgeon to the king, who have long resided in Cayenne, affirm, that there are otters in that country so large, that they weigh ninety or one hundred pounds. They live in the great and unfrequented rivers, and their heads often appear above the water. Their cry is heard at great distances; their hair is very soft, but shorter than that of the beaver, and generally of a dark brown colour. They live upon fishes,

* See le Voyage de la Hontan, tom. i. p. 84.

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Plate 86

SMALL OTTER OF GUIANA.

and eat likewise the grains which fall into the water from the banks of the rivers.

I have added the figure of a small animal sent me from Guiana, under the name of *the small fresh-water otter of Cayenne* *, which appears to be the third species mentioned by M. la Borde. It is only seven inches long, from the tip of the nose to the extremity of the body. The tail of this small otter, like that of the water-rat, has no hair: its length is six inches seven lines, and five lines thick at the origin, diminishing gradually to the extremity, which is white, though the rest of the tail is brown; and in place of hair, it is covered with a rough granulated skin, like shagreen; it is flat below, and convex above. The whiskers, and the long hairs under the eyes, are about an inch in length. All the under part of the body and head, as well as the fore-part of the fore-legs, is white. The top and sides of the head and body are marked with large brownish black spots, and the intervals are of a yellowish gray colour. The black spots correspond on each side of the body. There is a white spot above the eye. The ears are large, and seem to be longer than those of the common otter. The legs are short; the fore-feet have five unconnected toes; there are the same number in the hind-feet, but they are connected with membranes.

* Lutra Saricovienna. L. grisea a[illegible] maculata.—*Shaw's Gen. Zool.* i. p. 447.

Saracovienne.—*Penn. Hist. Quadr.* ii. p. 32.

W.

THE SEA-OTTER*.

"THE *saricovienne*" (or sea-otter), says Thevet, "is found along the river Plata. It is of an amphibious nature, living more in the water

CHARACTER SPECIFICUS.

LUTRA MARINA. [illegible] plantis pilosis, cauda corpore quadruplo breviore.—*Erxleb. Mamm.* p. 445.

MUSTELA LUTRIS. M. plantis palmatis pilosis, cauda corpore quadruplo breviore.—*Linn. Syst. Nat. Gmel.* i. p. 92.—*Schreb.* iii. pl. 128.

LUTRA MARINA.—*Steller, Nov. Comm. Petrop.* t. 2, p. 367, pl. 26.

SEA-OTTER.—*Penn. Hist. Quadr.* ii. p. 83.—*Arctic Zool.* i. p. 88, No. 36.—*Shaw's Gen. Zool.* i. p. 444, pl. 101.

HABITAT

in Asia septentrionali atque America, in litoribus marinis majoribusque fluviis. *W.*

Sea otter, with a black nose; upper jaw longer and broader than the lower; long white whiskers; irides hazel; ears small, erect, and conic. In each jaw there are four cutting teeth. The grinders are broad, adapted for breaking and comminuting crustaceous animals and shell-fish. The skin is thick. The hair [illegible] long, thick, and excessively black and glossy, beneath which is a [illegible]oft down. The colour sometimes varies to silvery. The legs are thick and short. The toes are covered with hair, and [illegible]ined by a web. The hind-feet are exactly like those of a sea[illegible] and have a membrane skirting

than upon land. This animal is as large as a cat; and its skin, which is a mixture of a gray and black, is as fine as velvet. Its feet resemble those of water-fowl; and its flesh is extremely good and delicate *." I begin with the above passage, because the animal is unknown to the naturalists under this name, and because they know not that the *carigueibeju* of Brazil, which is the same animal, has membranes between the toes. Marcgrave, indeed, who gives a description of it, mentions not this character, which is an essential one, since it brings this species as near as possible to that of the otter.

Besides, I believe that the animal mentioned by Gumilla, under the name of *guachi* †, may

the outside of the exterior toe, like that of a goose. The length, from nose to tail, is four feet two inches. The tail is thirteen inches long, flat, fullest in the midle, and ... pointed. The biggest of these animals weigh seventy or eighty pounds.—*Penn. Synops. Quadr.* p. 241.

* Singularités de la France antarctique, par Thevet, p. 107.

† On the rivers which fall into the Oronoco, there are a great many water-dogs, which the Indians call *guachi*. This animal swims swiftly, and feeds upon fishes. It is amphibious; but goes likewise in quest of food upon the land. It digs ditches on the banks, where the female brings forth her young. These ditches are not made in retired places, but where the animals live in common, and come to amuse themselves. I carefully examined their habitations, and found them to be always exceedingly clean. They leave not the smallest herb in the neighbourhood. They heap up, at a distance, the fragments of the fishes they eat, and, by leaping, going, and returning, they make their roads extremely neat and commodious. *Hist. del Orenóque, par Gumilla,*

be the same with the saricovienne, which is a species of otter common throughout all South America. From the description given of it by Marcgrave and Desmarchais *, it appears that this amphibious animal is as large as a middle-sized dog: that the top of its head is round, like that of the cat; that its muzzle is somewhat long, like that of the dog; that it has the teeth and whiskers of a cat: small, round, black eyes; ears roundish and placed low; five toes on each foot, with the thumbs shorter than the other toes, which are all armed with sharp brown claws. The [illegible] is as long as the hind-legs. The hair is very short, and very soft. It is black on the body and brown on the head, with a white spot under the chin. Its cry is nearly like that of a young dog; and it is sometimes interrupted by another cry similar to that of the sagoin, or fox-tailed monkey. It feeds upon crabs and fishes; but it may likewise be nourished with the flour of manioc diluted in water. Its skin makes a good fur; and, though it lives chiefly on fishes, its flesh is very good, wholesome, and has no bad flavour †.

tom. iii. p. 29. *Nota,* These characters correspond with the saricovienne: but the name *guachi* seems to be here improperly applied, because it probably belongs to a species of mouffette, which we have called the *coase*.

* Voyage de Desmarchais, tom. iii. p. 306.

† Vast numbers of sea-otters are found about Bering's Island, Kamtschatka, the Aleutian and Fox islands, between Asia and America, and in the interior sea, as far as has been discovered to the east of De Fuca's Straits.—They are very harmless animals, and so singularly affectionate to their young, that

they never desert them, and will even pine to death for their loss. They are said to produce but one at a time, which they fondle between their fore-feet: and before the young can swim, they carry it in their paws, lying in the water on their backs, in which posture they can swim very swiftly. They are taken in several different ways, and their flesh is preferred to that of seals by the natives of Kamtschatka. The unfortunate crew commanded by Captain Bering, however, found it insipid, and so hard and tough, that they were obliged to cut it into small pieces before they could eat it. They swim extremely well, and have been seen a hundred leagues from the land. Their skins are exceedingly valuable, and are sold in great quantities to the Chinese. Some of them will fetch from fourteen to twenty-five pounds each. What a profitable trade, says Mr. Pennant, might not a colony carry on, was it possible to penetrate to these parts of North America, by means of the rivers and lakes! the access to Pekin would then be easy, by sailing up the gulf of Petchell. At present, these valuable furs are carried by land above 3,000 miles to the frontiers of China, where they are delivered to the merchants.

W.

THE CANADIAN OTTER.

THIS otter, which is much larger than ours, and ought to be found in the north of Europe, as well as in Canada, affords me an opportunity of inquiring whether it is the same animal with the *latax* of Aristotle, which, he remarks, is much larger and stronger than the common otter. But the ideas he gives of it correspond not entirely with this large otter; and, finding that it was perfectly similar to the common otter, except in size, I thought it was not a particular species, but a simple variety: and, as the Greeks, and especially Aristotle, were careful not to give different names but to distinct species, we are persuaded, that the *latax* is another animal. Besides, as the otters, like the beavers, are generally larger, and have finer and blacker hair in America* than in Europe, this otter of Canada ought to be longer and blacker than the French otter. But, on considering what the

* The otters of North America differ from those of France by being commonly longer and blacker. They are of different shades, and some of them are as black as jet: and these last are dearest and in greatest request. — *Descript. de l'Amerique Septent. par Dennis,* tom. ii. p. 280.

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Plate 87

CANADIAN OTTER.

latax of Aristotle might be, I conjectured that it was the animal mentioned by Belon, under the name of the *sea-wolf*. I shall, therefore, relate what Aristotle has said of the *latax*, and Belon of the *sea-wolf*, that the reader may have an opportunity of making the comparison *.

In this passage, Aristotle mentions six amphibious animals; and, of these six, we know only three, the common seal, the beaver, and the otter. The other three, namely the *latax*, the *satherion*, and the *satyrion*, remain unknown, because they are only pointed out by their names, without any description. In this case, as in all

* Sunt inter quadrupedes ferasque, quæ victum ex lacu et fluviis petant; at vero a mari nullum, præterquam vitulus marinus. Sunt etiam in hoc genere fiber, satherium, satyrium, lutris, *latax* quæ latior lutra est, dentesque habet robustos, quippe quæ noctu plerumque egrediens, virgulta proxima suis dentibus ut ferro præcidat; lutris etiam hominem mordat, nec desistit, ut ferunt, nisi ossis fracti crepitum senserit. Lataci pilus durus, specie inter pilum vituli marini et cervi. — *Arist. Hist. Anim.* lib. viii. cap. v. — The sea-wolf: "As the English have no land-wolves, Nature has furnished them with an animal that frequents the shores of their seas, which makes so near an approach to our wolf, that, if it did not prefer fishes to sheep, we would reckon it to be the very same, whether we consider its size, its hair, its head (which is always large), or its tail. But as this animal (he remarks) lives only on fishes, and was unknown to the ancients, it seems to be no less singular than the double-lived animals mentioned above; for which reason, I have given a figure of it. — *Belon de la Nature de Poissons*, p. 18. *Note*, The figure is on pl. xix, and resembles the hyæna more than any other animal; but it could never be the hyæna; for he is not amphibious; neither does he live on fishes; and, besides, he belongs to a different climate.

those where no direct induction can be derived from a knowledge of the object, we must have recourse to the mode of exclusion; but this mode can never be employed with success, except when we know nearly the whole subject. For example, from long study, I believe that I am acquainted with nearly the whole quadruped tribe. I know that Aristotle could have no information concerning those which are peculiar to the continent of America. Of the quadrupeds, I likewise know all those which are amphibious: from these I, in the first place, strike off all those which belong to America, as the tapir, the cabiai, the ondatra, or musk-rat, &c. There remain only the amphibious animals of our own continent, which are, the hippopotamus, the walrus or sea-cow, the seals or sea-calves, the sea-wolf of Belon, the beaver, the otter, the sable, the water-rat, the Muscovy musk-rat, the water shrew-mouse, and, if you choose, the ichneumon, which some authors have regarded as an amphibious animal, and called it the *Egyptian otter*. From this number, I retrench the walrus or sea-cow, which, being found only in the northern seas, was unknown to Aristotle. I likewise retrench the hippopotamus, the water-rat, and the ichneumon, because he mentions them elsewhere under their proper names. Lastly, I retrench the seals, the beaver, and the otter, which are well known, and the water shrew-mouse, which is too similar to the land one to have ever received a separate name. There remain, then, the sea-wolf of Belon, the sable, and the Mus-

covy musk-rat, for the *latax*, the *satherion*, and the *satyrion*. Of these three animals, the sea-wolf of Belon alone is larger than the otter: hence it alone can represent the *latax*; and, consequently, the sable and the Muscovy musk-rat must represent the *satherion* and the *satyrion*. These conjectures, which I believe to be well founded, are not, however, of the number of those which time can elucidate, unless some Greek manuscripts, hitherto unknown, shall be discovered, where these names are employed, and new explications given of them.

THE MARTIN*.

MOST naturalists have described the martin and the pine-weesel, or yellow-breasted martin,

* VIVERRA.

CHARACTER GENERICUS.

Dentes primores sex, intermediis brevioribus.
Molares plures quam tres.
Lingua in aliis lævis, in aliis retrorsum aculeata.
Ungues exserti.
Corpus elongatum.

CHARACTER SPECIFICUS.

VIVERRA FOINA. — *Shaw's Gen. Zool.* i. p. 409.

MUSTELA FOINA. M. corpore fulvo-nigricante, gula alba. — *Erxleben. Mamm.* p. 458. — *Schreber.* iii. pl. 129.

MUSTELA FOINA. — *Linn. Syst. Nat. Gmel.* i. p. 95.

Mustela pilis in exortu albidis castaneo colore terminatis vestita, gutture albo. — *Briss. Quadr.* p. 178.

MARTES DOMESTICA. — *Gesn.* p. 765. — *Aldrov.* p. 332. — *Jonst. Quadr.* p. 156.

LA FOUINE. — *Buff. Hist. Nat. par Sonn.* xxiv. p. 356.

MARTIN. — *Penn. Hist. Quadr.* ii. p. 41. — *Brit. Zool.* i. No. 15, pl. 6.

HABITAT

in Europa australiore, in sylvis et circa domos. Vulgaris in Gallia et Anglia, Scotiæ exul rarioque in borealibus.

W.

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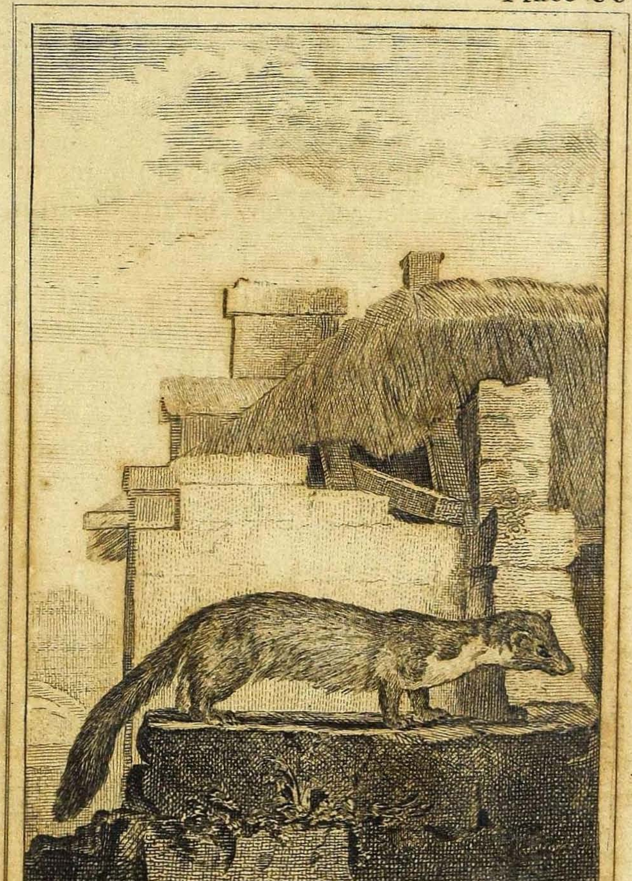
Plate 88



MARTIN

as animals of the same species. Gesner and Ray *, in imitation of Albertus, affirm, that they intermix promiscuously. This fact, however, which is supported by no other evidence, appears, at least, to be doubtful: I believe, on the contrary, that these animals have no intercourse, but form two distinct and independent species. To illustrate this point, I shall give a few reasons. If the pine-weesel were only a wild martin, or the martin a domestic pine-weesel, the first would constantly preserve the same characters, and the latter would be subject to variations; as the wild cat uniformly remains the same, while the domestic cat assumes all sorts of colours. The martin, on the contrary, never varies, but preserves its peculiar characters as constantly as the pine-weesel retains those which are proper to it. This alone is a sufficient proof, that these two animals are specifically different, and that the one is not a simple variety of the other. Besides,

This animal has broad rounded ears, lively eyes, a brown head, tinged with red; the body, sides, and legs are covered with hair, ash-coloured at the bottoms, bright chesnut in the middle, and black at the tips; the throat and breast are white, and the belly deep brown; the tail is full of hair, and of a dusky colour; the feet are broad, and covered at bottom with thick down; the claws are white; and the length of the body is eighteen inches, and of the tail ten. — *Penn. Synops. Quadr.* p. 215.

In Latin, *Martes domestica, Foyna, Gainus, Schismus*; in Italian, *Foina, Fouina*; in German, *Hukss marder*; in French, *la Fouine*.

* Gesner, Hist. Quadr. p. 76. — Ray, Synops. Quadr. p. 200.

there is no reason for regarding the martin as a domestic animal: he is no more domestic than the fox or the polecats, which, like him, approach the habitations of men in quest of their prey; and he has no greater communication with mankind than the other animals we call wild or savage. The martin, therefore, differs from the pine-weesel both in disposition and temperament; for the latter flies the open fields, lives in the most secret recesses of the forest, and is never numerous in cold climates: but the martin approaches our habitations, takes up his abode in old buildings, in hay-lofts, and in holes of the walls. The species is likewise spread in great numbers over all the temperate countries, and is even found in warm regions, as in Madagascar *, and the Maldiva islands †, and is never seen in high latitudes.

The martin has a fine countenance, a lively eye, supple limbs, and a flexible body. His movements are all exceedingly nimble; he rather bounds and leaps, than walks. He climbs rough walls with ease and alacrity; enters the pigeon or hen-houses, eats the eggs, pigeons, fowls, &c., and the female often kills great numbers, and transports them to her young. He likewise seizes mice, rats, moles, and birds in their nests. I kept one of these animals a considerable time. He tamed to a certain degree; but never formed any attachment, and continued always so wild,

* See Voyages de Struys, tom. i. p. 30.

† Voyage de Pyrard, tom. i. p. 132.

that it was necessary to chain him. He made war against the rats, and attacked the poultry, whenever they came in his way. He often got loose, though chained by the middle of the body. At first, he went to no great distance, and returned in a few hours, but without discovering any symptoms of joy or of affection to any particular person. He, however, called for victuals like a cat or dog. Afterwards he made longer excursions, and, at last, he thought proper never to return. He was then about a year and a half old, seemingly the age at which nature assumes her full ascendency. He ate every thing presented to him, except salad and herbs. He was fond of honey, and preferred hemp-seed to every other grain. We remarked, that he drank very often; that he sometimes slept two days successively; that, at other times, he would sleep none for two or three days; that, before sleeping, he folded himself in a round form, and covered his head with his tail; and that, while awake, his motions were so violent, so perpetual, and so incommodious, that, though he had not disturbed the fowls, we found it necessary to chain him, to prevent him from breaking every thing. We have had in our possession several other martins of a more advanced age, which had been taken in nets; but they continued to be totally savage, bit all who attempted to touch them, and would eat nothing but raw flesh.

Martins, it is said, go with young as long as cats. We meet with young ones from spring to autumn; and, therefore, it is probable that they

bring forth more than once a year. The younger females litter only three or four at a time; but the more aged produce six or seven. When about to bring forth, they take up their abode in magazines of hay, in holes of walls (which they stuff with straw and herbs), in clefts of rocks, or in the hollow trunks of trees; and, when disturbed, they remove their young, who seem to arrive very soon at maturity; for the one I kept had nearly attained its full growth in one year: hence we may conclude, that those animals live eight or ten years only. They have a kind of musky smell, which is not very disagreeable. The pine-weesel and the martin, like some other animals, have two vesicles, one on each side of the extremity of the rectum, which contain an odoriferous matter, similar to that procured from the civet cat. Their flesh retains a little of this odour; and yet that of the pine-weesel is not bad. The flesh of the martin is more disagreeable, and the skin is likewise much less valuable *.

I have added the figure of an American animal, which was sent from Guiana to M. Aubry, curate of St. Louis. Though this animal wants the teeth, it is so similar in all the other parts of the body to the common martin, that it may be regarded as a variety of the same species. It differs

* The skins of martins are in request in Turkey, for the use of the fur. Tournefort says, that those of Dauphiny are particularly valued at Smyrna, a vest made of martin's fur being worth from eighty to a hundred crowns. The deepest in colour are sometimes mixed with the sable. *W.*

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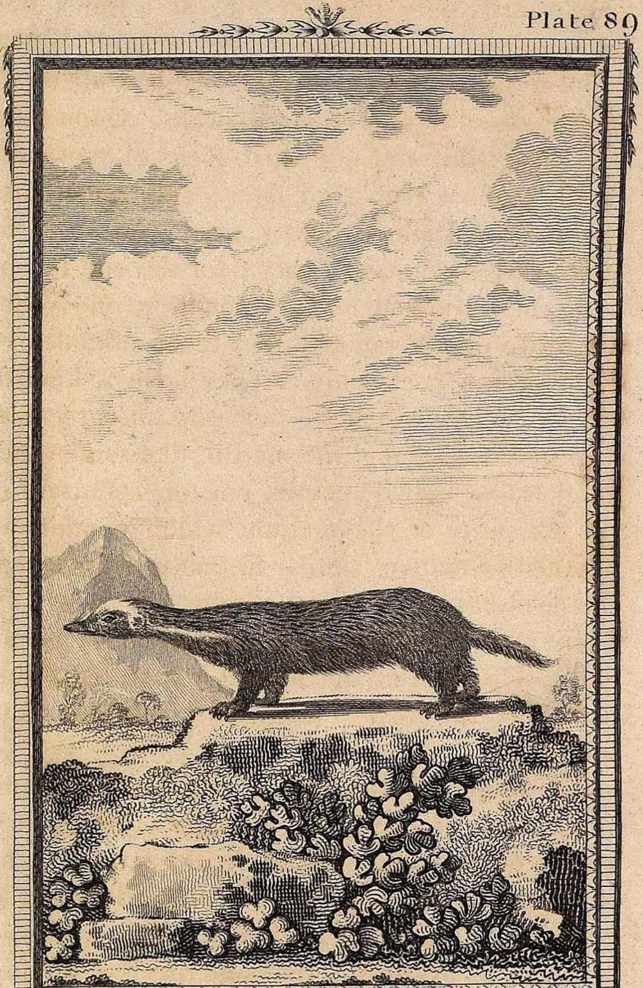
Plate 89

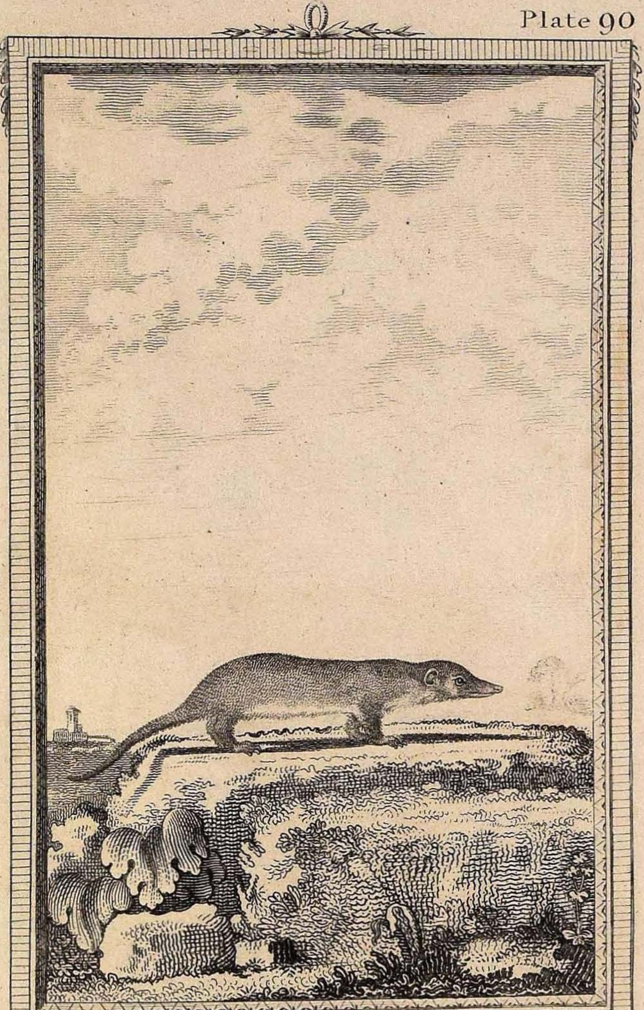


A. Bell Sculpt.

MARTIN of GUIANA.

212 B

Plate 90



A. Bell Sculp.^t

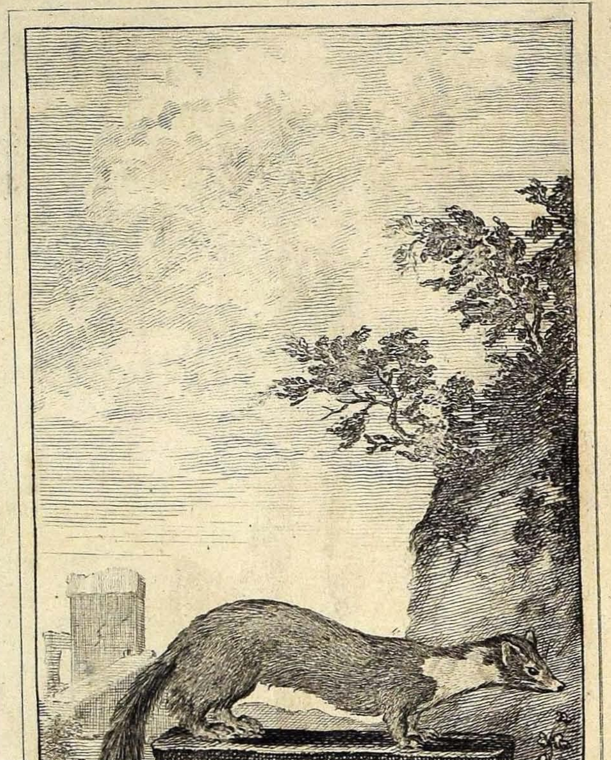
SMALL MARTIN of GUIANA.

from the martin only in having the colour of the hair sprinkled with black and white, a shorter tail, and spots on the head. The martin of Guiana is three or four inches longer than the European; but the tail is proportionally shorter. The muzzle seems also to be longer; it is black, and the blackness extends above the eyes, passes under the ears along the neck, and loses itself in the brown hair of the shoulders. There is a large white space above the eyes, which spreads upon the front, surrounds the ears, forms a narrow band along the neck, and disappears on the shoulders. The ears are perfectly similar to those of the martin. The top of the head is gray, mixed with white; the neck is brown, interspersed with ash-coloured hairs; and the body is covered with a mixture of white and blackish hairs. These hairs are gray and ash-coloured at their origin, then brown, and black and white at the extremities. The under part of the jaw is of a blackish brown colour, which extends under the neck, and vanishes towards the belly, which is of a bright brown, or chesnut. The legs and feet are covered with shining reddish black hair; and the toes have a greater resemblance to the toes of the squirrel and rat than to those of the martin. The great toes of the fore-feet are four lines long; but those of the hind-feet only two. The tail is more bushy at the origin than the extremity, and the hair of it is chesnut, or a bright brown mixed with black.

We have given the figure of another Cayenne animal, which seems to have a great analogy to

the former. It was drawn from the life at the fair of St. Germain, in 1768, and measured fifteen inches from the tip of the nose to the origin of the tail, which was eight inches, and more bushy at the root than at the extremity. This animal is short legged, like our martins: the form of the head approaches nearly to that of the martin; but in the ears there is no resemblance. The body is covered with woolly hair: there are five toes on each foot, armed with small claws, like those of the martin.

214A



YELLOW BREASTED WEASEL

THE PINE-WEESEL, OR YELLOW-BREASTED MARTIN *.

THIS animal is a native of northern regions, where the species is so numerous, that the quan-

* CHARACTER SPECIFICUS.

VIVERRA MARTES. — *Shaw's Gen. Zool.* i. p. 410.

MUSTELLA MARTES. M. corpore fulvo nigricante, gulo flava. — *Erxleb. Mamm.* p. 455. — *Linn. Syst. Nat. Gmel.* i. p. 95. — *Schreb.* iii. pl. 130.

Mustela pilis in exortu e cinereo albidis castaneo colore terminatis vestita, gutture flavo. — *Briss. Quadr.* p. 179.

MARTES SYLVESTRIS. — *Gesn. Quadr.* p. 760.

MARTES AVICTUM. — *Ray's Quadr.* p. 200.

LA MARTE. — *Buff. Hist. Nat. par Sonn.* xxv. p. 99, pl. 1, fig. 1.

PINE-MARTIN. — *Penn. Hist. Quadr.* ii. p. 42. — *Arctic Zool.* i. No. 27. — *Brit. Zool.* i. No. 16. — *Bew. Quadr.* p. 231.

HABITAT

in borealibus Europæ, Asiæ, Americæque; rarior in Anglia atque Gallia. Degit in Sylvis antiquis, præcique pinetis, nunquam ad domos. *W.*

Weesel with a yellow breast and throat; the hair is of a dark chesnut colour, and of far superior fineness to the for-

tity of their furs annually consumed is perfectly astonishing. There are very few of them in the temperate climates, and they exist not in very warm countries. Some of them are found in the forests of Burgundy, and likewise in those of Fountainbleau; but, in general, they are as rare in France as the martin is frequent. There are none of these animals in Britain; because they have no forests in that country *. They fly equally inhabited countries and uncovered fields. They dwell in the woods, and conceal not themselves among the rocks, but traverse the forest, and climb the trees. They live by hunting, and destroy prodigious quantities of birds, by eating their eggs. They seize squirrels, field-mice, &c. They also eat honey, like the martin and polecat. They never appear in the open fields, in the meadows, or in the vineyards. They approach not the dwellings of men; and they differ still farther from the martin in their manner of making their escape from the hunters. When the martin is pursued by a dog, he instantly runs to his hay-loft or his hole. The pine-weesel, on the contrary, runs a long time before the dogs, then

mer; in other respects agreeing with it.—*Pennant's Synops. Quadr.* p. 216.

In Latin, *Martes, Marta, Marterus*; in Italian, *Marta, Martura, Marturo, Martorello, Martire*; in Spanish, *Marta*; in German, *Field Marder, Wild Marder*; in Swedish *Mard*; in French, *La Marte.*

* Pennant very properly remarks on this passage, that the count never did our kingdom the honour of making a progress through it.

W.

climbs the trunk of a tree, and, from this station he views them as they pass. The track which he leaves in the snow appears to be that of a large animal, because he always leaps, and both feet make but one impression. He is somewhat larger than the martin, and yet his head is shorter. His legs are longer, and consequently he runs more easily. His neck is yellow; but that of the martin is white. His hair is finer, more bushy, and less subject to fall off. The female prepares not a bed for her young, and yet lodges them most commodiously. The squirrels build nests in the tops of trees, with equal art as the birds. When the pine-weesel is about to bring forth, she climbs to the squirrel's nest, banishes the possessor, enlarges the entry to it, and there deposits her young. She likewise uses the old nests of ducks or buzzards, and holes of ancient trees, from which she dislodges the woodpeckers, and other birds. She brings forth in the spring, and her litter consists of two or three only. Though her young come into the world blind, they soon acquire a considerable growth. She brings to them eggs and birds; and afterwards leads them out to hunt along with herself. The birds are so well acquainted with their enemies, that, when they perceive the pine-weesel, they utter the same mournful cry to advertise his approach, as when they see a fox. What shows that the birds are animated with hatred, rather than fear, is, that they follow at a distance, and utter this peculiar cry

against all carnivorous animals, as the wolf, the fox, the pine-weesel, the wild cat, &c., but never against the stag, the roe, the hare, &c.

The pine-weesels are very frequent in the northern parts of America, Europe, and Asia. Many of them are brought from Canada, and they extend as far as Hudson's Bay *†; and, in Asia, as far north as the kingdom of Tonquin ‡ and the empire of China §. They ought not to

* Lade's Voyages, vol. ii. p. 227.

† In one of the Hudson's Bay Company's annual sales, 12,370 good skins, and 2,360 damaged ones were sold; and in that year (1743) 30,325 were imported by the French from Canada, into the port of Rochelle.

Captain Meares observed martins at Nootka, which perfectly resembled those of Canada, but they were not so black, neither was the fur so fine. He likewise met with another kind of martins, with such coarse hair, that the natives set very little value on the skins.

Vast numbers of fine martins inhabit the province of Ufa, in Russia; the skins sell for sixty or seventy kopecs * a piece, according to the quality; sometimes, when the buyers are numerous, they will even fetch a rouble †. The inhabitants of the province follow these little animals in winter upon their snow shoes, and kill them either with guns or with blunt arrows: sometimes they cut down the trees where they shelter themselves, and hunt them with dogs. — *Pallas's Travels, French edition*, 8vo. tom. ii. p. 421.

W.

‡ Tavernier, tom. iv. p. 182. Hist. Gen. des Voyages, tom. vii. p. 117.

§ Hist. Gen. des Voyages, tom. vi. p. 562.

* About two shillings.

† About four shillings and twopence.

be confounded with the sable, an animal whose fur is much more precious. The sable is black; but the pine-weesel is brown and yellow. The most valuable part of the skin of the latter is the brown, which extends along the whole back to the extremity of the tail.

THE GREAT GUIANA MARTIN*.

THIS animal, which was sent us from Cayenne, and which we have represented in plate 92, is much larger than our French martin. It is two feet long from the end of the nose to the origin of the tail; its hair is black, with the exception of that on the head and neck to the shoulders, which is grayish: the end of the nose and the nostrils are black: the whiskers, the part about the eyes, and that above the nose, are of a reddish brown. It has six cutting teeth in each jaw; the lower ones are the smallest: the canine teeth are very strong: we did not count the grinders. Like the common and the French pine-martin, it has long whiskers on each side the muzzle: and it also resembles the martin in the ears, which are large, and almost round; under the throat, there is a great, yellowish-white spot, which descends, and is spread upon the breast. There are five toes on each foot;

* LA GRANDE MARTE DE LA GUIANE.—*Buff. par Sonn.* xxv. pl. 1, fig. 2.

GRAY-HEADED WEESEL.—*Shaw's Gen. Zool.* i. p. 434. This seems to be a variety rather than a distinct species.

W.

220A

Plate 92

Warner Sc.

GREAT GUIANA MARTIN.

the nails are whitish, crooked, and grooved; those on the fore-feet are six lines in length, while those behind are five only.

The tail, which is eighteen inches long, and terminates in a point, is covered with black hair like the rest of the body, but of two or three inches in length: this tail is longer in proportion than that of our martin; for it is three fourths the length of the body, whilst in our martin it scarcely amounts to half.

THE POLECAT*.

THE polecat has a great resemblance to the martin in temperament, disposition, manners, and figure. Like the latter, he approaches our

* CHARACTER SPECIFICUS.

VIVERRA PUTORIUS. — *Shaw's Gen. Zool.* i. p. 415, pl. 98.

MUSTELA PUTORIUS. M. corpore flavo nigricante, ore auriculisque albis. — *Linn. Syst. Nat. Gmel.* i. p. 96. — *Schreb.* iii. t. 131.

Mustela pilis in exortu ex cinereo albidis colore nigricante terminatis vestita, oris circumferentia alba. — *Briss. Quadr.* p. 186.

MUSTELA PUTORIUS. M. flavo nigricans, ore auriculumque apicibus albis. — *Erxleb. Mamm.* p. 463.

PUTORIUS. — *Gesn. Quadr.* p. 767. — *Aldrov.* p. 329. — *Jonst. Quadr.* p. 154, t. 64. — *Ray's Quadr.* p. 199.

LE PUTOIS. — *Buff. Hist. Nat. par Sonn.* xxv. p. 108, pl. 1, fig. 3.

FITCHET. — *Penn. Hist. Quadr.* ii. p. 97. — *Brit. Zool.* i. No. 14, pl. 6.

POLECAT. — *Shaw's Gen. Zool.* i. p. 415, pl. 98.

HABITAT

in Europæ temperatæ, non frigidæ; rupes et lapidum acervos circa domos.

W.

The polecat has the space round the mouth and the tips of the ears white; the head, body, and legs, of a chocolate colour, almost black; on the sides the hairs are of a tawny cast,

222 A

Plate 93

POLE CAT

habitations, mounts on the roofs, takes up his abode in hay-lofts, barns, and unfrequented places, from which he issues during the night only in quest of prey. He steals slily into the court-yards, voleries, and pigeon-houses, where, with less noise than the martin, he makes greater havoc, cutting off the heads of all the fowls, and then transporting them one by one to his magazine. If, as frequently happens, he cannot carry them off entire, on account of the smallness of the entry to his hole, he eats the brains, and takes only their heads along with him. He is likewise very fond of honey, attacks the hives in winter, and forces the bees to abandon them. He never retires far from the abodes of men. The spring is their season of love: the males fight for the female on the roofs of houses. They afterwards leave her, and go to pass the summer in the fields or in the woods. The female, on the contrary, continues in her habitation till she brings forth, and does not lead off her young till toward the end of summer. She litters three or four, and sometimes five, suckles them but a short time, and accustoms them early to eat blood and eggs.

In the villages, they live upon poultry; and, in the country, they hunt for prey. During the

and the tail is black; the length of the body is seventeen inches, and of the tail six.

In Latin, *Putorius*; in Italian, *Foettæ, Puzolo*; in German, *Iltis, Ulk, Buntsing*; in Polish, *Vydra, Tchorz*; in French, *Le Putois*.

summer, they take up their abode in rabbit-holes, in the clefts of rocks, or in the hollow trunks of trees, from which they issue out in the night, and roam about the fields and woods, searching for the nests of partridges, larks, and quails. They climb trees in quest of the nests of other birds. They lie in watch for rats, field-mice, and moles; and carry on a perpetual war against the rabbit, who cannot escape them, as they enter with ease into his hole*. A single family of polecats is sufficient to destroy a whole warren. This would be a simple method of diminishing the number of rabbits in places where they are too abundant.

The polecat is somewhat less than the martin: his tail is also shorter, his muzzle sharper, and his hair blacker and more bushy: he has white hair on his front, and likewise on the sides of the nose and round the mouth. He differs still more from the martin in his voice; the martin has a sharp piercing cry; the cry of the polecat is more

* During a severe storm, one of these animals was traced in the snow from the side of a rivulet to its hole, at some distance from the water: as it was observed to have made frequent trips, and as other marks were to be seen in the snow, which could not be easily accounted for; it was thought a matter worthy of attention: its hole was accordingly examined, the polecat taken, and eleven fine eels were discovered to be the fruits of its nocturnal excursions. The marks in the snow were occasioned by the motion of the eels in the creature's mouth. This fact, which is related by Bewick, is singular, since it points out an unusual mode, in the polecat, of procuring subsistence. *W.*

blunt. Each of them, as well as the pine-weesel and squirrel, has a deep grunting tone, which they repeat often when irritated. Lastly, the odour of the martin is very different from that of the polecat, which, instead of being agreeable, is extremely fetid; and, from this circumstance, the animal obtained its Latin name *putorius.* He sends forth this insupportable odour to a great distance, especially when irritated. The dogs will not eat the flesh of the polecat; and even his skin, though good, is in no estimation, because it never loses entirely its natural smell. This odour proceeds from two vesicles near the anus, from which an unctuous matter continually exudes; and the effluvia of it is extremely offensive in the polecat, ferret, weesel, badger, &c.; but it constitutes, on the contrary, a species of perfume, in the civet-cat, pine-weesel, martin, &c.

The polecat seems to be confined to the temperate climates: few or none of them are found in the northern regions; and, in warm countries, they are still more rare than the pine-weesel. The meles Surinamensis, or stifling weesel, is an animal of a different species; and the polecat appears to be bounded, in Europe, from Italy to Poland*. This animal, it is certain, avoids the cold; for, in winter, he retires into the houses, and his steps are never seen in the snow, either

* In Siberia, the hair of the polecat loses its deep colour, and becomes whitish. Dr. Pallas saw this white variety in Russia, as well as in the southern parts of Siberia.

W.

in the woods or in fields which are distant from the habitations of men; he, perhaps, is equally averse to great heat; for he is never found in warm climates *.

* In the ci-devant province of Lorrain, polecats are very numerous, and much dreaded by the farmers, on account of the havoc they make in the poultry yards.

W.

226A

Plate 94

Warner Sc

STRIPED INDIAN POLE-CAT.

THE STRIPED INDIAN POLECAT*.

THIS animal, which M. Sonnerat brought from India, and which in his Travels he calls the *wild cat of India*, appears to us not to belong to the cat kind, but rather to that of the polecat. It is neither like a cat in the shape of its head, of its body, of its ears, nor in its feet, which are short in the cat, but long in this animal, especially those behind: the toes are curved like the squirrel's, the nails crooked, like cats; it is perhaps this last character which has induced M. Sonnerat to call this animal a cat: however, its body is long, like the polecat's; which it also resembles in the shape of its ears, they being very different from those of the cat.

This animal, which inhabits the coast of Coromandel, is fifteen inches long from the end of the muzzle to the origin of the tail: in size it approaches the polecat. The head, which is four inches from the nose to the occiput, is of a

* CHARACTER SPECIFICUS.

VIVERRA FASCIATA. V. caudæ pilis longis nigris et rufescentibus, corpore griseo fasciis sex nigris longitudinalibus vario, subtus albo. — *Linn. Syst. Nat. Gmel.* i. p. 92.

Chat Sauvage a bandes noir des Indes. — *Sonnerat. Voy.* ii. p. 143, pl. 90.

LE PUTOIS RAYE DE L'INDE.—*Buff. par Sonn.* XXV. p. 114, pl. 2, fig. 1.

FASCIATED WEESEL. — *Shaw's Gen. Zool.* i. p. 405, pl. 97.

HABITAT

in India. *W.*

brown colour mixed with yellow; the orbit of the eye is very large, and edged with brown: the distance of the end of the muzzle from the anterior angle of the eye is ten lines, and from the posterior angle fourteen lines: the space round the eyes, the under side of the nose, and the cheeks, are of a pale yellow; the end of the nose, the nostrils, the whiskers, and the hair above the eyes, are black. The ear is flat, round, and shaped like that of the polecat; it is naked, except some whitish hairs round the auditory channel. Six large black bands run along the back, from the occiput to the crupper, and these bands are alternately separated from each other by five long straight stripes, of a whitish colour. Beneath the lower jaw, and on the inside of the fore-legs, the colour of the hair is very pale yellow, on the outside it is brown mixed with dirty white. The outside of the hind-legs is brown, mixed with a little yellow and light green: on the inside, as well as on the thighs, the hair is white, and in several places pale yellow: all the under part of the belly is a dirty white; the longest hair upon the body measures eight lines.

The tail is nine inches long, and terminates in a point: it is covered with brown hairs mixed with yellow, the same as upon the back of the head. The hind-feet are the longest: the fore-feet, including the nails, are sixteen lines in length, and the hind-feet twenty-one. The five toes of each foot are covered with whitish and brown hairs; the nails of the fore-feet measure three lines, those of the hind-feet, four lines.

It has six cutting teeth and two canine in each jaw.

228 A

FERRET.

228B

Plate 96

FERRET.

THE FERRET*.

WHETHER the ferret and polecat belong to different species has been a subject of doubt

* CHARACTER SPECIFICUS.

VIVERRA FURO. V. flava, oculis rubicundis.—*Shaw's Gen. Zool.* i. p. 418.

MUSTELA FURO. M. pedibus fissis, oculis rubicundis.—*Linn. Syst. Nat. Gmel.* i. p. 97.

Mustela corpore pallide flavo.—*Erxleb. Mamm.* p. 465.—*Schreb.* iii. pl. 133.

Mustela viverra mas, pilis subflavis, longioribus castaneo terminatis vestita, et Mustela viverra femina, pilis ex albido subflavis vestita.—*Briss. Quadr.* p. 177.

MUSTELA SYLVESTRIS.—*Aldrov.* p. 327.—*Ray's Quadr.* p. 198.

LE FURET. *Buff. Hist. Nat. par Sonn.* XXV. p. 117, pl. 2, fig. 3.

FERRET.—*Penn. Hist. Quadr.* ii. p. 10.—*Bew. Quadr.* p. 228.—*Shaw's Gen. Zool.* i. p. 418, pl. 98.

HABITAT

in Africa, olim in Hispaniam translata ad destruendos cuniculos; nunc et in reliqua Europa, passimque domestica pro cuniculi venatione. *W.*

This animal has a very sharp nose, red fiery eyes, and round ears; the colour of the whole body is a very pale yellow; its length is about fourteen inches, and that of the tail five.—*Penn. Synops. Quadr.* p. 214.

In Latin, *Viverra, Furo, Furunculus*; in Spanish, *Huron*;

with some naturalists. The resemblance of colour, in some ferrets, to that of the polecat, may have given rise to this doubt. The polecat, however, is a native of temperate climates, and is a wild animal, like the martin. But the ferret is a native of warm countries, and cannot subsist even in France, unless in a domestic state. The ferret alone is used in hunting rabbits, because he is more easily tamed than the polecat. Both, indeed, have a strong and disagreeable odour. But the most convincing proof of their being different animals, is, that they have no intercourse with one another*, and differ in a number of essential characters. The body of the ferret is thinner and more lengthened, his head narrower, and his muzzle sharper, than that of the polecat. He is not endowed with the same

Furam; in German, *Frett, Frettel, Furette*; in Polish, *Laska*, in French, *Le Furet*.

* The count is mistaken in this point, since the matter has been put beyond all dispute by the following fact. The Rev. Mr. Lewis, vicar of Llansowel in Carmarthenshire, had a tame ferret, which used to go about the house: at length it absented itself for several days, and on its return proved with young: it produced nine of a deep brown colour, more resembling the polecat than the ferret. Mr. Lewis had no male of this species for it to couple with; neither was there any within three miles, and those closely confined. Mr. Pennant, who notices this circumstance, says, that warreners are sometimes obliged to procure an intercourse between these animals, to improve the breed of the latter, which, by long confinement, is apt to become less eager after rabbits, and consequently less useful.

instinct in finding subsistence, but, at least in our climates, must be carefully nourished within doors, and cannot exist in the fields; for those which are lost in the burrows of rabbits never multiply, but probably perish during the winter. The ferret also, like other domestic animals, varies in colour; and is equally common in warm regions *, as the polecat is rare.

The female ferret is less than the male: when in season, she is so extremely ardent, that, we are assured, she dies, if her desires are not gratified †. Ferrets are brought up in casks or boxes, where they are furnished with beds of hemp or flax. They sleep almost continually. Whenever they awake, they search eagerly for food, which consists of bran, bread, milk, &c. They produce twice every year: the female goes six weeks with young: some of them devour their young as soon as they are brought forth, instantly come again in season, and have three litters, which generally consist of five or six, and sometimes seven or eight, and even nine.

This animal is by nature a mortal enemy to the rabbit. Whenever a dead rabbit is, for the first time, presented to a young ferret, he flies upon it, and bites it with fury; but if it be alive, he seizes it by the throat or the nose, and sucks its blood. When let into the burrows of rabbits, he is muzzled, that he may not kill them in their holes, but only oblige them to come out,

* The ferret is found in Barbary, and is called *Nimse.*—See *Shaw's Travels.*

† Gesn. Hist. Quadr. p. 763.

in order to be caught in the nets. If the ferret is let in without a muzzle, he is in danger of being lost; for, after sucking the blood of the rabbit, he falls asleep; and even smoking the hole is not a certain method of recalling him; because the holes have often several entries which communicate with each other, and the ferret retires into one of these, when incommoded with the smoke. Boys likewise use the ferret for catching birds in the holes of walls or of old trees.

According to Strabo, the ferret was brought from Africa into Spain; which is by no means improbable, as Spain is the native climate of rabbits, and the country where formerly these animals most abounded. It may, therefore, be presumed, that, in order to diminish their number, which perhaps was incommodious, ferrets were imported for the purpose of hunting rabbits in a profitable manner, instead of multiplying martins, which would have destroyed the rabbits without bringing any advantage to the hunters.

The ferret, though easily tamed and rendered docile, is extremely irascible. His odour is always disagreeable; but, when irritated, it becomes much more offensive. His eyes are lively, and his aspect is inflammatory; all his movements are nimble, and he is at the same time so vigorous, that he can easily overcome a rabbit, though at least four times larger than himself.

Notwithstanding the authority of commentators, it is still uncertain whether the ferret be the

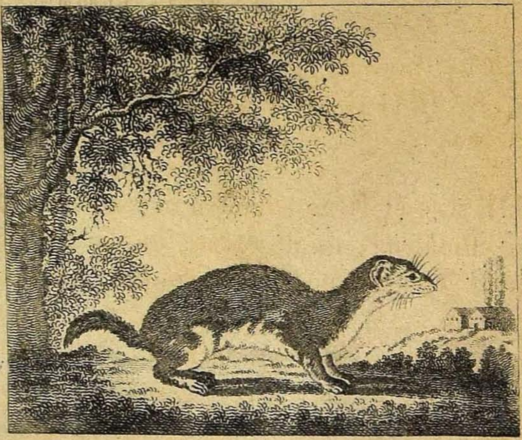
ictis of the Greeks. "The ictis," says Aristotle, "is a species of wild weesel, smaller than the little Maltese dog, but resembling the weesel in its hair, in the whiteness of the under part of the body, and likewise in the craftiness of its manners. It admits of being tamed; and makes great havoc among the bee-hives, being extremely fond of honey. It also attacks birds, and, like the cat, has an osseous penis*." 1. There appears to be a contradiction in saying that the ictis is a species of wild weesel, which admits of being tamed; for the common weesel, which, in this country, is the most savage of the two, is perfectly irreclaimable. 2. The ferret, though larger than the weesel, can never be compared for size to the lap-dog. 3. The ferret appears not to have the cunning of the weesel, nor indeed any craftiness at all. Lastly, he never attacks the bee-hives, nor is he fond of honey. I inquired of M. le Roi, inspector of the royal chases, concerning this last fact. His answer follows: "M. de Buffon may be assured, that the ferrets have no predilection for honey; but, when hungry, may be made to eat it. I have fed them several days with bread soaked in water mixed with honey. The two last days, they eat it in pretty large quantities; but the weakest of them began to be sensibly emaciated." This is not the first time that M. le Roi has obliged me with important facts. Having no ferrets, I tried the same experiment on the ermine, by giving him only pure honey to eat, and a little milk for drink:

* Hist. Anim. lib. ix. cap. 6.

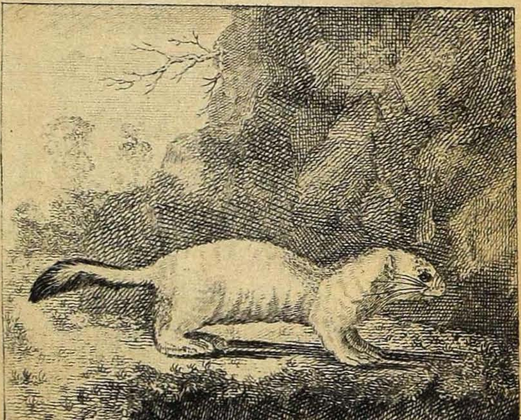
but he died in a few days. Thus neither the ermine nor the ferret are fond of honey, like the ictis of the ancients; which inclines me to think, that the word *ictis* is perhaps only a generic name; or if it marks any particular species, it ought rather to be applied to the martin or polecat, both of which possess the craftiness of the weesel, attack the bee-hives, and are extremely fond of honey*.

* Sonnini has given a note on the subject of the ictis to this effect. The ictis of the ancients is recognised in a Sardinian animal which we have never seen. Cettic has mentioned it in his Natural History of Sardinia, but he confounds it with the weesel, which is not found there. M. Azuni has thrown much light on the subject. The true weesel is not known in Sardinia: the little quadruped which they call *bocamele*, on account of its taste for honey; although it resembles the weesel, both in shape and colour, differs, nevertheless, sufficiently to form a distinct species. The chief traits of dissimilarity are in the manners. The *bocamele* has, like the ictis of the Greeks, a very tameable disposition; it is also very fond of honey, and devours the contents of the bee-hives. The children in Sardinia encourage the animal to follow them by showing it a piece of bread dipped in honey. It is naturally gentle, and, when tamed, becomes amiable and caressing. In several parts of the island it is called *dona di muro*, because it loves to enter and remain in the holes of walls. *W.*

234A



WEASEL.



ERMINE.

THE WEESEL*.

THE weesel is as common in temperate and warm climates†, as it is rare in the northern regions. The ermine, on the contrary, abounds

* CHARACTER SPECIFICUS.

VIVERRA VULGARIS.—*Shaw's Gen. Zool.* i. p. 420.

MUSTELA VULGARIS. M. corpore ex rufo fusco, subtus albo, cauda concolore.—*Linn. Syst. Nat. Gmel.* i. p. 99.—*Schreber,* iii. pl. 138.

MUSTELA VULGARIS. — *Aldrov.* p. 307. — *Jonst. Quadr.* p. 152, pl. 64.—*Ray's Quadr.* p. 195.

MUSTELA.—*Gesn. Quadr.* p. 307.

MUSTELA NIVALIS. M. corpore albo, caudæ apice vix pilis ullis nigris. — *Linn. Syst. Nat. Gmel.* i. p. 99. Var. ε.

LA BELETTE.—*Buff. Hist. Nat. par Sonn.* xxv. p. 125, pl. 8, fig. 1.

WEESEL. — *Penn. Hist. Quadr.* ii. p. 33. — *Shaw's Gen. Zool.* i. p. 420, pl. 98.

HABITAT

in temperatis Europæ, et in Africa boreali, rarior in Europa boreali. Est quoque in America boreali, nisi forte hæc vera Erminea sit. Degit in Sylvis et ad domos. *W.*

The weesel has small rounded ears; the whole upper part of the body is of a tawny brown colour, and the under part is

† The weesel is found in Barbary, and is called *Fert-el Heile.*—*Shaw's Travels.*

in the north, is seldom met with in temperate climates, and never in warm countries. These animals, therefore, form two distinct species. The common weesel sometimes turns white during the winter, even in our climate *. This circumstance might give rise to its being regarded as of the same species with the ermine. This mark is common to both: but there are others in which they differ. The ermine is reddish in summer, and white in winter; but the end of its tail is uniformly black. The end of the weesel's tail is yellow, even when the animal turns white in winter. It is, besides, always of a smaller size, and its tail is much shorter than that of the ermine. The weesel dwells not, like the ermine, in woods and deserts, but near the habitations of men. I have kept both species together; but animals which differ in climate, in constitution, and in disposition, never intermix.

entirely white. It has a brown spot beneath the corners of the mouth. The length of its body is between six and seven inches, and of the tail two and a half.

In Greek, Γαλῆ; in Latin, *Mustela*; in Italian, *Dennola, Ballottula, Benula*; in Spanish, *Comadreia*; in German, *Wisele*; in French, *La Belette*; in English *Weasel, Weesel, Foumart, Whitred.*

* In Norway, Sweden, Russia, and Siberia, it always becomes white in winter, and, on the approach of summer, changes again to a blackish brown: it has neither the vivacity nor the beauty of the weesel inhabiting the south of Europe. In Siberia, where they are called *laski*, the inhabitants either hunt them with dogs, or catch them in snares: their skins are sold to the Chinese for three or four rubles the hundred.

W.

It is true, some weesels are larger or smaller than others; but the difference never exceeds an inch in the whole length of the body. But the ermine is two inches longer than the largest weesel. Neither of them can be tamed, but are kept wild in iron cages. Neither of them voluntarily eat honey, nor attack the bee-hives like the polecat and martin. Thus the ermine is not the savage weesel, nor the ictis of Aristotle, which, he says, is easily tamed, and very fond of honey. The weesel and ermine, instead of being easily tamed, are so wild, that they will not eat when any person looks at them: they are in perpetual agitation, always endeavouring to conceal themselves: and, if a man wants to keep them, he must furnish them with a bundle of wool or flax, in which they wrap and hide themselves from the light. Thither they drag every thing they can lay hold of, and never eat but in the night. They allow fresh meat to lie three or four days, and even till it corrupt, before they touch it. They sleep three fourths of the day, and watch their prey during the night. When a weesel gets among the poultry, he attacks not the cocks or old hens, but singles out the chickens and young birds, whom he kills with a single bite on the head, and then carries off the whole one by one. He likewise breaks the eggs, and sucks them with incredible avidity. In winter they generally live in granaries and barns, where they often remain during the spring, and bring forth their young among the hay and straw. During this period the female makes war, with

more success than the cat, against the rats and mice, who cannot escape her, because she follows them into their holes. She mounts the pigeon-houses, and destroys the pigeons, sparrows, &c. In summer they retire farther from houses, especially into low grounds, about mills, along rivulets, conceal themselves among brushwood, in order to surprise birds, and often take up their abode in old willows, where the female brings forth her young: she prepares for them a bed of straw, leaves, and other herbage, and litters, in the spring, from three to five. The young, like those of the polecat, pine-weesel, and martin, are brought forth blind; but they very soon acquire growth and strength enough to follow their mother in the chase. The weesels attack serpents, water-rats, moles, field-mice, &c., and, overrunning the meadows, they devour quails and partridges, together with their eggs. Their motion consists of unequal and precipitant leaps; and, when they want to mount a tree, they make a sudden bound, by which they are at once elevated several feet high. They leap in the same manner when they attempt to seize a bird.

These animals, as well as the polecat and ferret, have a disagreeable odour, which is stronger in summer than in winter; and, when pursued or irritated, their smell is felt at a considerable distance. They move always with caution and with silence, and never cry, but when they are hurt. Their cry is sharp, rough, and very expressive of resentment. As their own odour is offensive, they seem not to be sensible of a bad

smell in other bodies. A peasant in my neighbourhood took three new-littered weesels out of the carcase of a wolf that had been hung on a tree by the hind feet. The wolf was almost entirely putrified, and the female weesel had made a nest of leaves and herbage for her young in the thorax of this putrid carcase.

The author here ingenuously quotes a letter he received from the countess of Noyan, dated at the castle of Manceliere in Britany, July 20, 1771, in which that lady assures him, that he had injured the character of the weesel, by alleging that no art could reclaim or render him docile; because she had tried the experiment upon a young weesel taken in her garden, which soon learned to recognise and to lick the hand from which it received its food, and became as familiar, caressing, and frolicsome as a dog or squirrel.

This fact the author had still farther confirmed by a similar experiment made by M. Giely de Mornas, who trained a young weesel so completely, that the animal followed him wherever he went. The method of taming them is, to stroke them often and gently over the back, and to threaten, and even beat them, when they bite. Their odour is never offensive, but when they are irritated. They are fed with milk boiled

flesh, and water; and, unless they be starved, never eat honey, although presented to them.

The author has farther illustrated this subject by some observations sent him in a letter from Mademoiselle de Laistre, in the year 1782.

THE ERMINE*.

THE weesel with a black tail, is called the *ermine* and *roselet* by the French; the *ermine* when it is white, and the *roselet* when it is red

* CHARACTER SPECIFICUS.

VIVERRA ERMINEA. — *Shaw's Gen. Zool.* i. p. 426.

MUSTELA ERMINEA. M. caudæ apice atro. — *Linn. Syst. Nat. Gmel.* i. p. 98.

MUSTELA ERMINEA. M. auricularum marginibus albis, caudæ apice nigro. — *Erxleb. Mam.* p. 474.

Mustela hieme alba, æstate supra rutila, infra alba, caudæ apice nigro. — *Briss. Quadr.* p. 176.

L'HERMINE OU LE ROSELET. — *Buff. Hist. Nat. par Sonn.* xxv. p. 153, pl. 3, fig. 2.

STOAT. — *Penn. Hist. Quadr.* ii. p. 35.

STOAT OF ERMINE. — *Penn. Brit. Zool.* i. No. 18, pl. 7.— *Bew. Quadr.* p. 223. — *Shaw's Gen. Zool.* p 426, pl. 99.

HABITAT

in Europa, Asiaque boreali, in sylvis rarioribus betulinis et locis uliginosis. *W.*

The upper part of the body is of a pale, tawny, brown colour; the edges of the ears and ends of the toes, of a yellowish white; the throat, breast and belly white; the end of the tail black: the length of the body is ten inches, and of the tail five and a half. In the north of Europe, this animal becomes entirely white at the approach of winter, except the end of

or yellowish. Though less frequent than the ordinary weesel, they are still found in considerable numbers, especially in the ancient forests, and sometimes, during winter, in fields bordering upon woods. It is easy, at all seasons, to distinguish them from the common weesel; for the end of their tail is always of a deep black, and the borders of the ears and toes are white.

We have little to add to what we formerly remarked concerning this animal *. We shall only observe that it changes its colour, as usual, in winter. I had one sent me, in the beginning of March, 1757, which was then white. I kept it till April, 1758, when it would probably have become white had it been at liberty; but it was confined in an iron cage, against the bars of which it perpetually rubbed, and, as it had not been sufficiently exposed to the cold, it still preserved its summer coat. It remains as savage as ever, and has lost nothing of its bad smell. In every other circumstance, it is a healthy vivacious animal, has lively eyes, a fine countenance, and movements so rapid, that it is impossible to follow them with the eye. It has always been fed with eggs and flesh; but it touches not meat

the tail; and it resumes its brown colour in the spring.— *Penn. Synops. Quad.* p. 279.

In Latin, *Hermellanus, animal Ermineum*; in Italian, *Armellino*; in German, *Hermelin*; in Swedish, *Hermelin Lekatt*; in Polish, *Gronostay*; in French, *L'Hermine*, or *Le Roselet*; in English, *Ermine, Stoat.*

* See article Weesel.

till it has become putrid. It never inclined to eat honey; and, being deprived of victuals for three days, it died, after having taken a small quantity of honey. The skin of this animal is very precious. The furs of the ermine are finer and fairer than those of the white rabbit; but they soon turn yellowish; and, indeed, the ermines of our climate have always a slight tincture of yellow.

This animal is very frequent in the north, especially in Russia, Norway, and Lapland*†, where, as in every other place, they are reddish in summer and white in winter. They feed upon small animals, and particularly a species of rat, which abounds in Norway and Lapland, to be afterwards mentioned.

In the Natural History of Norway, by Pontoppidan, we have the following remarks:

"In Norway, the ermine lives among the fragments of rocks. This animal seems to belong to the weesel tribe. His skin is white, except the tail, which is spotted with black. The furs of Norway and Lapland preserve their white-

* Œuvres de Regnard, tom. i. p. 178.

† It abounds in Kamtschatka, the Kurili islands, and Siberia. In Kamtschatka, where they have so many furs of a superior quality, the ermine is not attended to; but in Siberia and Norway, their skins form a considerable article of commerce. In Siberia, they are taken in traps; in Norway, they are either shot with blunt arrows, or caught by a flat stone propped by a baited stick, which falls on the slightest touch, and crushes the animal to death. Their skins are sold on the spot for three or four pounds sterling a hundred. *W.*

ness better than those of Russia, which sooner turn yellowish; and, for this reason, the former are of greater request, even at Petersburgh. The ermine catches mice like the cat, and, when practicable, carries off his prey. He is particularly fond of eggs, and, when the sea is calm, he swims over to the islands which lie near the coast of Norway, where there are vast quantities of sea-fowls. It is alleged, that, when the female brings forth on an island, she conducts her young to the continent upon a piece of wood, piloting them with her snout. This animal, though small, kills those of a much larger size, as the rein-deer, and bear. He jumps into one of their ears when they are asleep, and adheres so fast by his teeth, that the creatures cannot disengage him. He likewise surprises eagles and heath-cocks, by fixing on them, and never quitting them even when they mount in the air, till the loss of blood makes them fall down."

The ermines are rare in temperate climates, and are never found in warm countries. The Cape animal, called the *ermine* by Kolbe *, and whose flesh, he remarks, is wholesome and agreeable to the palate, has no affinity to the ermine. The weesels of Cayenne, described by M. Barrere †, and the gray ermines of Tartary and of the northern parts of China, mentioned by some travellers ‡, are also animals different from our weesels and ermines.

* Descript du Cap de Bonne Esperance, p. 54.
† Descript. de la France Equinoctiale.
‡ Hist. Gen. des Voyages, tom. vi. p. 565—603.

244A

Plate 98

A Bell Sculpt.

GRISON.

244B

Plate 99

ROSELET.

MAHARAJA SERFOJI'S SARASWATI MAHAL * T.M.S.S.M. LIBRARY, TANJORE

THE GRISON, OR GRAY WEESEL*.

THIS animal is analogous to the weesel and ermine. M. Allamand gave the first description and figure of it under the name of the *grison*, in the 15th volume of the Dutch edition of my work, which he describes in the following manner: "I received," says he, "from Surinam, the small animal represented in the plate †. In the catalogue it was called the *gray weesel*, from which circumstance I derived the name *grison*, because I know not how it is denominated in

* CHARACTER SPECIFICUS.

[illegible] VITTATA. V. nigricans, vitta alba ad humeris ad frontem producta. — *Linn. Syst. Nat. Gmel.* i. p. 88.— *Schreb.* iii. pl. 124.

CHINCHE. — *Feuillé Voyag.* i. 272?

Le GRISON. — *Buff. Hist. Nat. par Sonn.* xxxiii. p. 25, pl. 1, fig. 3.

GRISON. — *Penn. Hist. Quadr.* ii. p[illegible] *Gen. Zool.* i. p. 389, pl. 95.

HABITAT

in Suranam, forsan in omni America Australi.

W.

† Edition de Hollande, tom. xv.

the country where it is found. The whole upper part of its body is covered with deep brown hair, having white points, which gives a grayish brown colour: under the head and neck is a bright gray, because the hairs there are very short, and the white part is of equal length with the brown. The muzzle, and the under part of the body and legs,. are black; which singularly contrasts with the gray colour on the head and neck.

"The head of this animal is very large in proportion to its body; its ears form almost a semicircle; its eyes are large; and its mouth is armed with strong grinders, and sharp tusks. It has six cutting teeth in each jaw, four of them hardly rising above the gums. Both the fore and hind-feet have five toes, with yellowish claws. The tail is pretty long, and terminates in a point.

The grison has a greater resemblan[illegible] the weesel than to any other animal. Bu[illegible] belongs not to the weesel tribe; for its [illegible] too short, and its legs are too long. It is not mentioned by any author or traveller. I showed it to several persons who had lived long in Surinam; but none of them knew it *, hence it

[illegible] said to be rare in Surinam, where it is called *crabbo dago*. It is extremely ferocious, and kills, indiscriminately, every animal it can conquer. Captain Stedman, who noticed its sanguinary manners, says, that one of them, which escaped from its cage in the ship, where it was confined in order to be sent to Holland, killed, in one night, all the monkeys, parrots, and fowls that were upon deck.

W.

either must be a rare animal, even in its native country, or it must live only in deserts and unfrequented places. The length of its body is about seven inches. I have not been able to learn any thing of its history."

THE SQUIRREL*.

THE squirrel is a little neat animal, and may be considered as in a state between savage and domestic. The gentleness, docility, and

SCIURUS*.

CHARACTER GENERICUS.

Dentes primores superiores cuneati, inferiores acuti.

Molares ad utrumque latus superiores quinque, inferiores quartuor.

Claviculæ perfectæ.

Cauda disticha.

CHARACTER SPECIFICUS.

Sciurus Vulgaris. S. auriculis apice barbati[illegible] dorso concolore. — *Linn. Syst. Nat. Gmel.* i. p. 14[illegible]. — *Shreber.* iv. p. 757, t. 212. — *Erxleb. Mam.* p. 411.

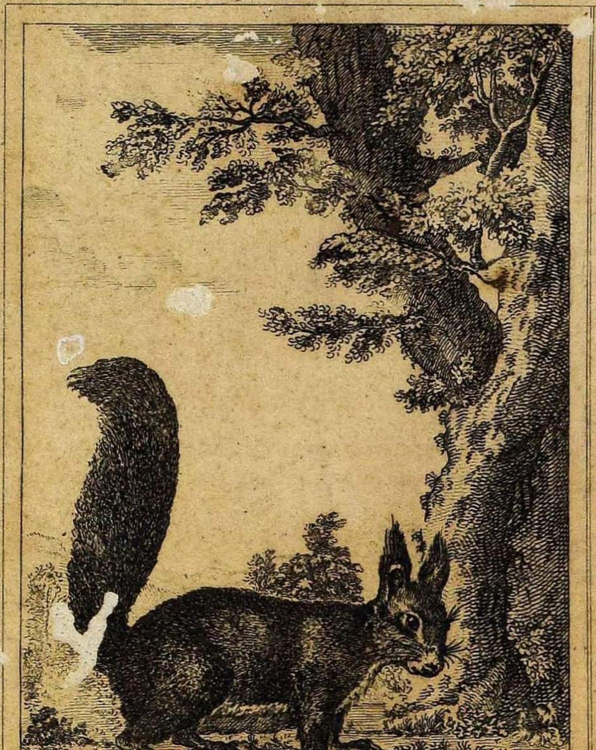
Sciurus (vulgaris) rufus, quandoque grispo admixto. — *Briss. Quadr.* p. 150.

Sciurus Vulgaris, — *Ray's Quadr.* p. 214.

[illegible] *Quadr.* p. 845. — *Aldrov.* p. 396. — *Jonst.* [illegible] p. 163, t. 66.

L'Ecureuil. — *Buff. Hist. Nat. par Sonn.* xxv. p. 165, pl. 3, fig. 3.

Common Squirrel. — *Penn. Hist. Quadr.* ii. p. 139. — *Brit. Zool.* i. No. 23. — *Arctic Zool.* i. p. 122. — *Bew. Quadr.* p. 352. — *Shaw's Gen. Zool.* ii. p. 131.



SQUIRREL.

inoffensiveness of his manners, entitle him to regard and affection. Though he sometimes seizes birds, he is neither carnivorous nor destructive. Fruits, almonds, nuts, beech-mast, and acorns, are his common food. He is handsome, lively, alert, and extremely vigilant and industrious. He has eyes full of fire, a fine countenance, a nervous body, and very nimble limbs. The beauty of his figure is heightened by a tail resembling a plume of feathers, which he raises the length of his head, and under which he shades himself from the sun and weather. The under part of his body is furnished with an apparatus equally remarkable, and which indicates strong generative powers. The squirrel partakes less of the nature of quadrupeds than most others of that tribe. He generally rests almost on end, and uses his fore-feet like hands, in carrying his

HABITAT

in Europa, America boreali, Asiaq borcali et temperata, usque adeo in Ceylonam. Degit in Sylvis.

W.

The common squirrel has two cutting teeth in each jaw; four toes before, and five behind; a long tail, cloathed with long hair; the ears terminated in long tufts of hair; the eyes are large, lively, and black; the head, body, legs, and tail, are of a bright reddish brown; the breast and belly are white; and the hair on each side of the tail lies flat. — *Penn. Synops. Quadr.* p. 272.

In Greek and Latin, *Sciurus*; in Italian, *Schirivolo, Chirivolo, Schirato, Schiratola*; in Spanish, *Harda-esquilo*; in German, *Eychorn, Eichhermlin*; in Swedish, *Ikhorn*; in Polish, *Wijervijorka*; in French, *L'Ecureuil.*

food to his mouth. Instead of concealing himself under the earth, he is perpetually in the air. He approaches the birds by his lightness; and, like the feathered tribes, he dwells on the tops of trees, and traverses the forests by leaping from one tree to another. He likewise builds his nest in the trees, gathers grains and seeds, drinks the dews, and descends not to the earth but when the trees are agitated by storms. He is never found in the open fields, nor in the plains. He approaches not the habitations of men, and never remains among brushwood; but delights in the lofty trees of the forest. Of water he is still more afraid than of the earth; and we are assured, that, when he wants to pass a river or lake, he employs the bark of a tree for a ship, and uses his tail for the rudder and sails. He sleeps not, like the dormouse, during the winter, but is at all seasons awake and lively; and, if the foot of the tree where he reposes be touched, he instantly leaves his little nest, and flies to another tree, or shelters himself under a branch. He collects nuts during summer, hides them in the trunks or hollows of old trees, and has recourse to them for his winter food: he likewise searches for them in the snow, and scratches off the surface of it with his feet. His voice is shrill, and still more piercing than that of the martin. When irritated, he makes a murmuring or grumbling noise. He is too light for walking; his movements consist of little leaps; and sometimes he makes considerable bounds. His

claws are so sharp, and his motions so quick, that he instantaneously climbs beech trees, though their bark be exceedingly smooth.

During the fine summer nights, the squirrels are heard crying, when pursuing each other among the trees. They seem to dread the heat of the sun; for, during the day, they remain in their nests, from which they issue, in the night, to eat, to frolic, and to make love. Their habitation is clean, warm, impenetrable to rain, and generally situated in the cleft of a tree. They begin the work by carrying small sticks, which they mix and interlace with moss: they then press and stamp it, to give it firmness and capacity for holding themselves and their young. A small strait aperture only is left near the top, which is hardly sufficient to allow them to pass. Above this aperture is a conical cover, which shelters the whole, and makes the rain run off the sides. They generally produce three or four at a litter: the females come in season in the spring, and bring forth in May, or the beginning of June. They cast their hair in winter, and the new fur is redder than the former. They comb and dress themselves with their hands and teeth, are very cleanly, and have no bad smell. Their flesh makes pretty good eating. The hair of their tail is used for pencils; but their skin is only an indifferent fur.

Several species of quadrupeds border upon that of the squirrel; but there are few varieties in the species itself. Some are of an ash colour; but the greatest number are reddish. The small

gray kind is a different species, and continues always gray: and, without mentioning the flying squirrels, the white squirrel of Cambaia *, which is very small, that of Madagascar †, called *tsitsihi*, which is gray, and neither beautiful nor easily tamed, the white squirrel of Siam ‡, the gray spotted squirrel of Bengal §, the striped squirrel of Canada ‖, the black squirrel ¶, the large gray squirrel of Virginia **, the squirrel of New Spain, with white stripes ††, the white squirrel of Siberia ‡‡, the variegated squirrel, or *mus ponticus*, the small American squirrel, that of Brazil, that of Barbary, the palm-rat, &c., form so many distinct and independent species of quadrupeds.

Squirrels should be considered rather as natives of northern regions, than of temperate climates; for they abound so much in Siberia, that immense numbers of their skins are annually sold in that country. The Siberians, says M. Gmelin, take the squirrels in traps, made nearly in the form of a fourth figure, which are suspended on the trees, and baited with a piece of dried fish §§.

It was formerly remarked, that there are black squirrels in America. M. Aubry, curate of Saint

* Les Voyages de Pietro della Valle, tom. vi. p. 368.

† Le Voyage de Flacourt, p. 164.

‡ Le second Voyage du P. Tachard, p. 249.

§ Voyages de la Comp. des Indes de Hollande, tom. vii.

‖ Le Voyage de Sagard Theodat, p. 305.

¶ L'Hist. Nat. de la Caroline, par Catesby, tom. ii. p. 73.

** Ibid. tom. ii. p. 76.

†† Albert Seba, vol. i. p. 76.

‡‡ Briss. Regn. Anim. p. 151.

§§ Voyage de M. Gmelin in Siberie, tom. ii. p. 232.

Louis, has, in his cabinet, a squirrel, sent him from Martinico, which is totally black. It is also distinguished from other squirrels by having no hair, or at least a very small quantity, on its ears.

M. de la Borde, king's physician at Cayenne, remarks, that, in Guiana, there is only one species of squirrel, which lives in the woods; that its hair is reddish; that it exceeds not the size of an European rat; that it feeds on the grain of the *Maripa*, *Aoura*, *Comana*, &c.; that it brings forth its young, to the number of two, in the holes of trees; that it bites like a rat; that it is easily tamed; that it makes a kind of low whistling cry; and that it is always seen alone, leaping from branch to branch.

I am not certain that this animal, mentioned by M. de la Borde, is a real squirrel; for these animals, in general, are not found in very warm climates, such as that of Guiana. The species, on the contrary, is very numerous in the cold and temperate regions of both continents.

"We find," says M. Kalm, "several species of squirrels in Pennsylvania, where the small kind, called the *ground-squirrel*, is preferred; because, though difficult to tame, it is most handsome. The large squirrels do much mischief to the plantations of maize. They cut the stems in order to eat the pith. They sometimes come by hundreds into a field, and often devour the whole wheat in a single night. In order to destroy them, a price is put upon their heads. The inhabitants eat the flesh of the squirrels, but put

little value on their skins *. The gray squirrels are common in Pennsylvania, and in several other parts of North America. In figure they resemble those of Sweden; but, both in summer and winter, they preserve their gray colour, and are likewise somewhat larger. They build their nests with moss and straw in the hollows of trees. They feed upon the fruits of the woods, but prefer the maize. They lay up provisions for winter, and remain in their magazines during the great colds. These animals not only do much injury to the maize, but likewise to the oaks, the flowers of which they devour, so that the trees produce few acorns. . . . . . It is alleged, that they are now more numerous in Pennsylvania than formerly, and that they have multiplied in proportion to the increase of the plantations of maize, which is their principal food †."

* Voyage de Kalm, tom ii. p. 245.

† In North America, the squirrels commit the greatest ravages on the plantations of maize. The damage they do to the planters is incredible: hundreds of them will come into a field, climb up the stalks, and eat the sweet corn which is wrapped up in the heads: thus, in one night, they will destroy that crop which has cost the poor farmer so much to raise. They are said to swarm in several of the provinces, and often descend in troops from the mountains, clearing the ground as they go of the fallen acorns, nuts, and beech-mast, making magazines of the overplus for their winter provisions, in holes which they dig under ground for that purpose. Their hoards, however, frequently fall a prey either to the hogs or the colonists, who seem equally anxious to discover them. On these magazines they place all their dependance, and frequently quit their nests to visit them, always returning with a

sufficient quantity of provisions to last them for some time. During the winter, this appears to be their only employment; as, in that season, they do not choose to quit their warm habitations, unless compelled by necessity. Whenever they are observed to be particularly busy in the autumn, and to run about the woods in greater number than usual, it is a certain sign that the weather will soon become severe; for the same instinct that teaches them to defend their nests from the wet, also directs them to provide against the inclemency of the approaching season, by laying in a larger stock than usual, lest the frost and snow should lock up their subterraneous magazines.

A reward of about threepence a head was once offered in America for their destruction; when in Pennsylvania alone, 8,000*l.* currency was paid in one year. Therefore, the number killed, in that time, must have amounted to 640,000.

W.

THE FLYING SQUIRREL*.

THIS animal is related by certain characters only, to the squirrel, the rat, and the *loir*, or fat squirrel. It resembles the squirrel in nothing

* CHARACTER SPECIFICUS.

SCIURUS VOLUCELLA. S. fuscus, subtus albido-flavescens, hypochondriis dilatatis, cauda lanceolata. — *Shaw's Gen. Zool.* ii. p. 155, pl. 150.

Sciurus hypochondriis extensis volitans, cauda elongata villosa. — *Linn. Syst. Nat. Gmel.* i. p. 153. — *Schreb.* iv. p. 808, pl. 222.

Sciurus minimus, hypochondriis prolixis volans, ventre albido. — *Brown, Jam.* p. 438.

Sciurus Americanus volans. — *Ray's Quadr.* p. 215.

MUS VOLANS. — *Linn. Syst. Nat.* p. 75.

ECUREUIL VOLANT. — *Du Pratz, Louisian.* ii. p. 98.

LE POLATOUCHE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 148, pl. 47.

FLYING SQUIRREL. — *Catesby's Carol.* ii. pl. 76. — *Penn. Hist. Quadr.* ii. p. 153. — *Edwards,* pl. 191.

HABITAT

in temperatiori et calidiori Americæ septentrionalis parte, in sylvarum arboribus gregatim. *W.*

Squirrel with round naked ears, full black eyes, and a lateral membrane from fore to hind-legs. The hair of the tail is long, disposed horizontally, and longest in the middle. The

but the largeness of its eyes, and the form of its tail, which, however, is neither so long, nor so bushy. It approaches the fat squirrel by the figure of its body, by the shortness and nakedness of its ears, and by the hairs on its tail, which are of the same figure and length. But it is not, like the fat squirrel, subject to be reduced to a torpid state by the action of cold. Hence the flying squirrel is neither a rat, a squirrel, nor a fat squirrel, though it participates of the nature of each of the three species.

Mr. Klein gave the first exact description of this animal in the Philosophical Transactions, 1733. It was known, however, long before that time. It is found equally in all the northern regions of the Old and New Continents*. But

colour above is a brownish ash, and beneath, it is white tinged with yellow. It is much less than the common squirrel.—*Penn. Synops. Quadr.* p. 293.

Buffon calls this animal *Le Polatouche,* from *Polatucha,* its Russian name. It is also called *Letaga* in Muscovy; *Wiewiorka, lataiaca,* in Poland; *Sahouesquanta* by the savages of Canada; and *Quimichpatlax* by other Indians of North America.

* In the country of the Hurons, there are three kinds of squirrels. . . . . . The flying squirrels, called *sahouesquanta,* are most valued. They are ash-coloured; their head is thick; and a membrane, or expansion of the skin, extends from the fore to the hind-feet, which they stretch out when about to fly. . . . . The females produce three or four at a litter, &c. —*Voy. du Pays des Hurons, par Sagard Theodat,* p. 306. There is another small animal, called *assapanick* by the Virginian Indians, and *flying squirrel* by the English, which, by

it is more common in America than in Europe, where they are rare, and confined to some northern countries, as those of Lithuania and Russia. This small animal dwells upon trees, like the squirrel. It moves about from branch to branch; and, when leaping from one tree to another considerably distant, the loose skin or membrane is stretched forward by the fore-feet, and backward by the hind-feet. The skin being thus stretched, and drawn out laterally above an inch, augments the surface of the body, without increasing its quantity of matter, and, of course, retards so much the acceleration of the fall, that, by a single leap, the creature is enabled to sail to a considerable distance. This motion has no resemblance to the flying of birds, or the fluttering of bats, both of which are performed by striking the air with repeated vibrations. It is only a simple leap, depending on a single impulse: the motion produced by that impulse is prolonged, because the animal's body is rendered speci-

extending the skin attached to its legs, in the form of wings, flies three or four hundred feet at a time. — *Hist. de Nouv. Monde, par Jean Laët,* lib. iii. p. 88. The flying squirrels are of the size of a large rat, and of a grayish white colour. They are as drowsy and indolent as the other squirrels are vigilant and active. They are called *flying squirrels,* because they fly from one tree to another by means of a membrane which extends, in the form of wings, when they take their little flights. — *Voy. de la Hontan,* tom. ii. p. 42. The flying squirrels come from North America; but they have lately been discovered in Poland. — *Edw. Hist. of Birds,* p. 191. — *Catesby, Hist. Nat. Carol.* tom. ii. p. 76.

fically lighter, is more powerfully resisted by the air, and, consequently, falls more slowly. The expansion of the skin from foot to foot is peculiar to the flying squirrel: and this character is sufficient to distinguish it from all other squirrels, rats, and dormice. But the most remarkable peculiarities of Nature are seldom confined to a single species. In the same genus, there is another animal with a similar skin, which extends not only from foot to foot, but from the head to the tail. This animal, a figure and description of which is given by Seba *, under the name of the *Virginian flying squirrel*, seems to differ so greatly from our flying squirrel, as to constitute a distinct species. We cannot, however, determine the nature of this animal; it may exist, and be of a different species from our flying squirrel. But it may be a simple variety only, or perhaps an accidental or monstrous production; for it is mentioned by no traveller or naturalist. Seba is the only person who has seen it in the cabinet of *Vincent*. I am always suspicious of descriptions made in cabinets; for the animals in these repositories are often manufactured in such a manner as to render their appearance most singular.

We have kept the flying squirrel a long time in a living state. It has been pointed out by many travellers. It is mentioned by Sagard Theodat †,

* Seba, vol. i. p. 72. tab. 44. fig. 3.

† Voyage au Pays des Hurons, p. 306.

Jean de Laet *, Fernandes †, La Hontan ‡, Denys §, Catesby ‖, Dumon ¶, Le Page du Pratz **, &c; and good descriptions and figures of it are given by Klein, Seba, and Edwards. Our own observations, with regard to this ani-

* Hist. du Nouveau Monde, p. 88.

† *Quimichpatlan, seu mus volans, fusco pilo nigroque promiscue tegitur, qui prope brachia et crura est prolixior, ac parvarum alarum formâ . . . . . . Est autem cæteris minor, parvo et murino capite, magnis auriculis,* &c.—*Fernand. Hist. Nov. Hisp.* p. 9. But this author is wrong when he says, that the long hair serves the animal for wings; for it is unquestionably the prolongation of the skin which answers this purpose.

‡ Voyage de la Hontan, tom. ii. p. 42.

§ The hair of the flying squirrels is blacker than in the French squirrels. Their wings extend from the fore to the hind-feet, are about two inches broad, very thin, and covered with fine down. Their flight seldom exceeds thirty or forty paces; but, if they fly from tree to tree, double these distances will be necessary.—*Descript. Geog. de Amerique Sept.* tom. ii. p. 331.

‖ Hist. Nat. de la Caroline, p. 76.

¶ In Louisiana, two species of squirrels are very common; the one is entirely similar to those of France, the other has a little more of the ash-colour, and between the two fore-feet there is a membrane, by means of which it springs from one tree to another at considerable distances.—*Mem. sur la Louisiane,* p. 81.

** The flying squirrels have received their denomination from their faculty of leaping from one tree to another, at the distance of about twenty-five or thirty feet. Their hind-feet are connected to the fore-feet by a membrane, which supports them in the air when they leap. They seem to fly; but they sink lower down, &c.—*Hist. de la Louisiane, par M. le Page du Pratz,* tom. ii. p. 98.

mal, correspond very well with what these authors relate. It is much smaller than the squirrel. The one in our possession weighed two ounces only, which is nearly the weight of a common bat; but the squirrel weighs eight or nine ounces. Some of them, however, are larger. We have a skin of a flying squirrel, which, from its dimensions, must have belonged to a larger animal than the ordinary kind.

The membrane, or expansion of the skin, which unites the fore and hind-legs of the flying squirrel, and supports it in the air, makes it approach to the bat. It also resembles the bat in its natural disposition; for it reposes and sleeps during the day, and resumes its activity in the evening. It is easily tamed; but it is subject to become enraged, and must be kept in a cage, or restrained by a small chain. Flying squirrels are fed with bread, fruits, and seeds. They are particularly fond of the buds and young shoots of the pine and birch trees. They search not for nuts and almonds, like the squirrels. They make a bed of leaves, in which they sleep during the whole day, and never depart from it till night, when stimulated by hunger. As they have little activity, they become an easy prey to pine-weesels, and other animals which climb trees; and of course, the species is not numerous, though the females generally bring forth three or four young at a time *.

* According to Dr. Pallas, the flying squirrel is common in the birch and pine forests of Siberia. They inhabit the

highest places, and make their nests in the trunks of trees. They never leave their holes in the day time, but seek their food among the birch trees, either as soon as it becomes dusk, or in the night. This consists of the catkins, which appear in the spring and ripen in the summer. They also feed on the buds of the pine tree. This little creature is seldom seen upon the ground, though, from a habit of cleanliness, it always deposits its dung at the foot of the tree where it lives, and by this means the hunters discover its haunts. When it springs from one tree to another, it expands the skin attached to its body with its feet, and thus flies to a considerable distance, sometimes using its bushy tail as a rudder to direct its motion.

The female brings forth from two to four young ones, which are born blind and naked: she attends them carefully, and covers them with her skin. *W.*

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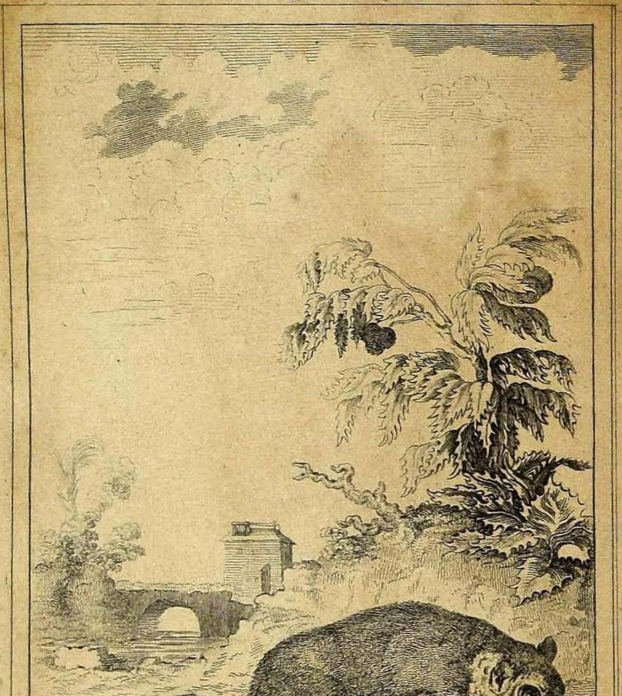
Plate 101



FLYING SQUIRREL.

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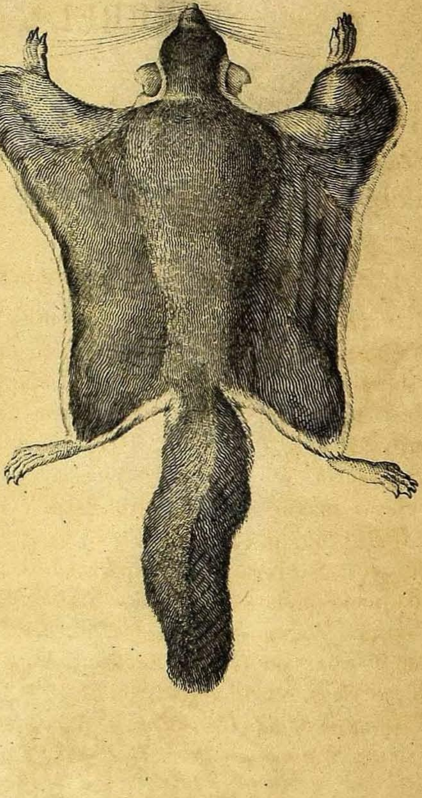
Plate 102



A. Bell Sculp.

FLYING SQUIRREL.

THE TAGUAN, OR GREAT FLYING SQUIRREL*.

I HAVE said, in the preceding article, that there are larger flying squirrels than those of which we have given descriptions, and that there

* CHARACTER SPECIFICUS.

SCIURUS PETAURISTA. S. hypochondriis prolixis volitans, supra saturatissime ex castaneo, subtus dilute ferrugineus, vel supra niger, subtus canus, cauda corpore longiore, villosissima, terete, nigricante, media ferruginea.—*Linn. Syst. Nat. Gmel.* i. p. 155.—*Pall. Miscell. Zool.* p. 54, pl. 6, fig. 1, 2.—*Schreb.* iv. pl. 224.

Sciurus maximus volans, sive FELIS VOLANS.—*Briss. An. Lugd. B.* 1762, p. 12, No. 15.

SCIURUS SAGITTA. S. hypochondriis prolixis volitans, cauda plano pinnata lanceolata.—*Erxleb. Mamm.* p. 439.

CIVETTA VOLANS.—*Valent. Ind.* iii. p. 269, 270.

LE TAGUAN OU GRAND ECUREUIL VOLANT.—*Buff. Hist. Nat. par Sonn.* xxvii. p. 163, pl. 10.

TAGUAN.—*Shaw's Gen. Zool.* ii. p. 160, pl. 152, 153.

SAILING SQUIRREL.—*Penn. Hist. Quadr.* ii. p. 151, pl. 78.

HABITAT

in Java, aliisque insulis indicis, rarus.

It may be remarked that a strong general resemblance takes place between the taguan and the petaurine opossum (didelphis petaurus), which in all probability, is also a native of many of the Indian isles, as well as of New Holland, and

is, in the Royal Cabinet, a skin five and a half inches long, while that of the common species exceeds not four inches. But this difference is nothing, when compared to that which subsists between our flying squirrel, and the East India *taguan*, whose skin was sent from Machian to the prince de Condé, who was so obliging as to allow me to examine it. This great flying squirrel, which is preserved in the cabinet of Chantilly, was twenty-three inches long, from the point of the nose to the extremity of the body. These animals are found not only at Machian, but in the Philippine islands, and probably in many other parts of India. The one just mentioned was taken on the Malabar coast. Its size is gigantic, when compared with the flying squirrels of Russia and America; for the latter exceeds not four and a half or five inches in length. Nevertheless, the taguan, or great flying squirrel, resembles the other species in figure and in the prolongation of the skin, which is perfectly similar. But, as the difference of size is so remarkable, it ought to be considered as a distinct species.

The great flying squirrel differs from the small, 1. In size, being twenty-three inches long. 2. In the length of the tail, which is twenty-one inches. Besides, the tail is not flat, like that of the common kind, but round, like that of the cat, and covered with long, blackish, brown hair. 3. The

may have been sometimes confounded by travellers with the taguan.—*Shaw's Gen. Zool.* ii. p. 161. *W.*

eyes and ears of both species are similarly situated, and the black whiskers are proportionally the same; but the head of the large kind is smaller in proportion to the size of its body. 4. The face is entirely black; the sides of the head, and the cheeks, are mixed with black and white hairs; on the top of the nose, and round the eyes, the hair is a mixture of black, white, and red. Behind the ears there are dark, long, brown hairs, which cover the sides of the neck; these are not to be found in the common kind. The top of the head, and of the whole body, as far as the tail, is sprinkled with black and white hairs, where the black predominates, because the white hairs are black at the roots, and become white near their extremities only. The under part of the body is of a dirty white colour, which extends below the belly. 5. The prolongation of the skin is covered above with dark brown hair, and below with yellowish ash-coloured hair. The legs are of a reddish black colour, and the upper part of the tail is brown. This brown shade grows gradually deeper till it becomes black at the extremity of the tail. 6. The feet of the great flying squirrel have the same number of toes as in the common kind; but those of the former are covered with black, and those of the latter with white hair. The claws are thin and hooked, like those of a cat. From this resemblance, and that of the tail, the animal has received the name of the *flying cat*. The large claw of the fore-feet is five lines and a half long, and the longest of the hind-feet only five lines.

The figure of this animal, drawn by M. de Seve as perfectly as the state of the dried skin would permit, is here represented. We have called it *le taguan*, in consequence of the following passage in the General History of Voyages*.

"In the Philippine islands, there is a species of flying cat, of the size of a hare, and of the colour of a fox, which the natives call *taguan*. It has wings like a bat, but covered with hair, which they make use of in leaping from one tree to another, at the distance of thirty palms."

After writing this article, a work of M. de Vosmaër, containing descriptions of several quadrupeds and birds, has come to my hands. I there read with pleasure the description of the great flying squirrel, and some remarks concerning the smaller species.

M. de Vosmaër informs us, that he saw, in the possession of the prince of Orange, two of the small flying squirrels alive; but that they did not live long.

"They slept," he says, "almost the whole day. When briskly pushed, they made a small effort, as if they intended to fly; but they stole away immediately, being exceedingly timid. They are fond of heat; and, when uncovered, they quickly concealed themselves under the wool which formed their bed. Their food was soaked bread, fruits, &c., which they ate, like the squirrels, by sitting on their posteriors, and holding the food with their fore paws. At the

* Hist. Gen. des Voyages, tom. x. p. 410.

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Plate 103

A. Bell Sculpt.

SAILING, or great FLYING SQUIRREL.

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Plate 104

A. Bell Sculp.t

Great FLYING SQUIRREL.

approach of night, they became more vivacious and restless. The difference of climate had unquestionably great influence on these animals, which appeared to be extremely delicate *."

These remarks of M. de Vosmaër correspond with my own observations. I have just now one of these little animals (March 17, 1775) living in a cage, with a small box in its bottom. It continues the whole day covered with the cotton, and comes out in the night only to take food. It has a faint cry, like that of a mouse, which is never heard but when the animal is forced out from among the cotton. Though its teeth are very small, it bites severely. Its hair is extremely smooth and agreeable to the touch. There is no way of making it extend its wings, but by obliging it to fall from a height. It is so remarkably chilly, that I cannot conceive how it can defend itself from the cold in the northern climates; since in France, if not kept in a chamber, and furnished with wool or cotton to lie on, and even to wrap itself all over, it would perish in a very short time.

With regard to the taguan, or great flying squirrel, let us attend to the remarks of M. de Vosmaër: "The small flying squirrel, described by M. de Buffon, has a great affinity to the larger species. They both have similar membranes, not for flying, but for supporting themselves in the air, when they leap from branch to branch.

* Descript. d'une Ecureuil Volant, par M. Vosmaër, p. 9.

"The skin of the *great flying squirrel*, which is a more proper appellation than that of the *flying cat*, was sent me in a dried state. M. Allamand has given a short description of this animal from a female subject preserved in the cabinet of the Leyden Academy.

"Valentine first mentioned these animals, and says, that they are found in the island of Gilolo, and go by the name of *flying civets*. He remarks, that they have long tails, like those of the monkeys; that, when at rest, their wings are not seen; that they are wild and timid; that their head is reddish, with a mixture of gray; that their wings, or rather membranes, are covered on both sides with hair; that their bite is so strong, that they easily escape from a wooden cage in a single night; that, by some people, they are called *flying monkeys*; that they are also found in the island of Ternat, where they were first mistaken for squirrels, only the head was thinner and larger, there was gray hair above the muzzle, and a black line run the whole length of the back; that the extensible skin, which adheres to their bodies, is garnished with hair, as white, on the under side, as that of the belly; and that, when they leap from tree to tree, they extend their membranes, and have then the appearance of being flat."

In the work of M. l'Abbé Prevost, it is said, that this animal is found in the Philippine islands, where it is called *taguan*.

"I have seen two females, the one in the Leyden cabinet, the other in that of *M. Heeteren*, at the Hague. The colour of the body was a

light chesnut, deeper on the back, and the end of the tail was blackish. The difference of sex is distinguishable by six small paps, placed at equal distances, in two rows, from the breast to the belly. I have also seen two males in the prince of Orange's cabinet. The length of the body, in Rhenish measure, was one foot five inches, and that of the tail one foot eight. The head is more pointed than that of the squirrel.

"The ears are small, pointed, and covered on the outside with short, fine, clear brown hair. Above the eyes, there are two long, brownish, yellow hairs; but there are none on the eyelids. On each side of the muzzle, there are long, black, rigid whiskers. The nose is naked; the teeth, like those of the squirrels, are two above and two below, of a deep yellow colour, and very long. The grinders are at the bottom of the muzzle.

"Both fore and hind-feet, especially the latter, are concealed by the membrane, which covers them nearly as far as the paws. The fore-feet are divided into four black toes, the two middlemost, and particularly the third, being much longer than the other two. The hind-feet are also black, and divided into five toes, four of which are of equal length; but the fifth, or innermost, is much shorter, and has the appearance of a simple appendage. The claws are large, sharp, black before, white below, and broad at the origin. The articulations of the toes are similar to those of the squirrels.

"The skin or membrane is thinnest in the middle, where it is about four inches broad on each side, and exceeds not the thickness of fine Indian paper. In other parts, it is also very thin, of a clear texture, and garnished with small chesnut hairs. Near the fore and hind-feet, it becomes thicker, and rises in the form of a bag, widest at the thighs, and growing gradually narrower towards the paws. This part is closely covered with brown and black hairs. Upon the fore-paws it appears loose, hangs down like a rag, and is covered with thick hair. The external edges of this skin are bounded with a thick selvage of black and gray hairs.

"The upper part of the head, the back, and the origin of the tail, are covered with pretty long, thick hairs, black in the under part, and mostly of a grayish white colour at the summits.

"The hairs of the tail are black, more gray near the body, and so disposed as to make the tail appear round.

"The cheeks are of a grayish brown colour; and the throat, breast, and belly, are of a clear whitish gray. On the under side of the membrane there are also gray hairs; but they are very thinly scattered."

The king's cabinet has acquired a taguan since this article was written, which is better prepared than the one we have described. It was sent to M. Aubry, rector of St. Louis, from the coast of Malabar. It is only fifteen inches

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Plate 105

Wazm Sc

TAGUAN *or* MALABAR.

nine lines long, which is but two thirds the size of the prince of Condé's: it is also evidently much younger, for the grinding teeth scarcely appear above the gums. Like other squirrels, it has two cutting teeth both above and below. The head seems small in proportion to the body; the nose is black; there are also black hairs mixed with some tawny ones round the eyes and jaws. The cheeks and top of the head are gray: the longest hairs of the whiskers, which measure an inch and ten lines, are black. The ears, like the squirrel's, are garnished with great blackish hairs, fourteen lines long: the hairs behind the ears are chesnut brown, and longer than those of the body. The under part of the neck is deep tawny mixed with black; the arms or fore-legs to the wrist, where the prolongation of the skin begins, are, as well as the skin itself, of a tawny black: this skin beneath, is of an ash-colour mixed with tawny brown. All the hair on the upper part of the body, from the crown of the head to the tail, is sprinkled with black and white, and this last colour prevails in some places: the hair is about an inch long. The thighs beneath the prolonged skin, are of a tawny in which the black prevails; the legs and feet are black: the nails are five lines long. The under part of the body is of a white gray, which extends to the neck. The tail, five inches long, is garnished with hairs measuring eighteen lines; this hair is of a gray black at the base of the tail, and increases in blackness to the tip.

THE GRAY SQUIRREL*.

THIS animal inhabits the northern regions of both worlds. It has a great resemblance to the squirrel, from which it differs only by the

* CHARACTER SPECIFICUS.

SCIURUS CINEREUS. S. cinereus, ventre albo, auriculis imberbibus. — *Linn. Syst. Nat. Gmel.* i. p. 147. — *Erxleb. Mam.* p. 418. — *Schreb.* iv. p. 766, pl. 213.

Sciurus Virginianus cinereus, auriculis ex albo flavicantibus. — *Briss. Quadr.* p. 153.

Sciurus major griseus, cauda extrema comosa, pilis diffusis. — *Browne, Jam.* p. 483.

LE PETIT GRIS. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 175, pl. 11.

GRAY SQUIRREL. — *Penn. Hist. Quadr.* ii. p. 144. — *Arct. Zool.* i. p. 116. No. 49. — *Catesb. Carol.* ii. p. 74, pl. 74. — *Shaw's Gen. Zool.* ii. p. 137, pl. 147.

HABITAT

in Americæ septentrionalis arboribus sylvaticis; nidificat in cavis arboribus. *W.*

The ears of the gray squirrel are plain: the hair is of a dull gray colour, mixed with black, and often tinged with a dirty yellow. The belly and insides of the legs are white. The tail is long, bushy, gray, and striped with black. It is about the size of a half-grown rabbit.—*Penn. Synops. Quadr.* p. 282.

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Plate 106

GRAY SQUIRREL.

following external characters: it is larger than the squirrel, and its hair is not reddish, but of a gray colour, more or less deep. The ears are deprived of the long hairs, which adorn those of the common squirrel. These differences, which are constant, seem sufficient to constitute a distinct species. Several authors maintain, that the gray squirrels of Europe differ from those of America; that the former belong to the common kind, whose colour changes with the season in our northern climates. Without pretending to deny this last fact, which, however, is not properly ascertained, we consider the gray squirrel of Europe and that of America as the same animal, and as a species distinct from the common squirrel; for our squirrels are found in North America as well as in the north of Europe. They are of the same size, and their colour is of a more or less lively red, according to the temperature of the climate. At the same time, we find, in both continents, other squirrels, which are larger, and whose hair is gray or blackish in all seasons. Besides, the fur of the gray squirrel is much finer and softer than that of the common kind. Hence it appears, that these two animals, the differences between which are constant, and their species, though very similar, have never intermixed, ought to be regarded as separate species. M. Regnard * affirms positively, that the gray squirrel-

* These gray squirrels are the same with the French squirrels, only their reddish colour changes to gray during the winter snows. The farther north, they turn always more gray. The Laplanders make war against them in the winter; and their dogs are so well trained to this species of hunting

rels of Lapland are the same animals with our French squirrels. This authority would be sufficient, were it not contradicted by other evidences. M. Regnard has written some excellent

that they never failed to discover the squirrels upon the highest trees, and to advertise the hunters who accompanied us. We shot some of them with our guns; for the Laplanders had not then their round arrows, with which they bring down these animals; and we had the pleasure of seeing with what dexterity and quickness they take off the skin. The hunting season begins about Michaelmas. Almost every native of Lapland is occupied in this business, which is a considerable article of commerce. Forty skins are sold for a crown. But there is no merchandise in which a man may be more deceived, than in that of the gray squirrel and ermines, for you buy without seeing, the fur side of the skins being always turned inmost. There is no distinction to be made. The good and bad are all sold at the same price. We learned from our Laplanders a surprising fact concerning these gray squirrels, which was afterwards confirmed by our own experience. They often change the places of their residence, and not one of them can be found during the whole winter where there were millions the preceding year. In their marches from one part of the country to another, when it becomes necessary to pass a lake or a river, which are very frequent in Lapland, these animals lay hold of a piece of pine or birch bark, which they draw to the edge of the water, mount upon it, and abandon themselves to the pleasure of the wind and waves. They erect their tails in the form of sails; but, if the wind blows too strong, or the waves rise high, both pilot and vessel are overturned. This kind of shipwreck, which often consists of three or four thousand sail, generally enriches some Laplanders, who find the dead bodies on the shore, and, if they have not lain too long on the sand, prepare the furs in the ordinary manner. But when the winds are favourable, the poor creatures make a happy voyage, and arrive at their destined port. This remarkable fact might have the appearance of a fable, if it had not fallen within my own observation.—*Œuvres de M. Regnard*, tom. i. p. 163.

theatrical works; but he was not much versant in natural history: neither did he remain long enough in Lapland to see the squirrels change their colour. It is true that some naturalists, and among this number is Linnæus, tell us, that in the northern regions the squirrels change their colour in winter *; which is not improbable, as, in these climates, hares, wolves, and weesels also change their colours. But this change is from yellow or red to white, and not from yellow or red to an ash colour. But, to confine ourselves to the squirrel, Linnæus, in the *Fauna Suecica*, says, *æstate ruber, hyeme incanus*. The change, therefore, is from red to white, or rather from reddish to whitish; and it is not easy to conceive why Linnæus, in the last edition of his *Systemæ Naturæ*, should have substituted, in place of *incanus*, the word *cinereus*. M. Klein † assures us, on the contrary, that the squirrels in the neighbourhood of Dantzick are reddish in winter as well as in summer; and that there are, in Poland, gray and blackish squirrels as well as the reddish kind, which never change their colour. These gray

* Sciurus vulgaris. . . . . habitat in arboribus frequens, æstate ruber, hyeme incanus.—*Faun. Suec.* p. 9. Sciurus vulgaris. . . . Æstate ruber, hyeme, cinereus.—*Syst. Nat.* p. 63.

† Sciurus vulgaris rubicundus. . . . Nostrates tam in silvis quam in caveis vulgares et hyeme et æstate rubri. . . . . In Polonia utique vulgares cinerei non mutantes pellem; haud rari quoque vulgares nigricantes, &c.—*Klein. Quad.* p. 53. —In Ukrania, inter sciuros coloris rutili, nigricantes spectantur.—*Rzaczynski, auct. Hist. Nat. Polon.* p. 321.

and blackish squirrels are found in Canada *, and in all parts of North America. Hence the gray squirrel may be regarded as an animal common to both continents, and of a different species from the ordinary squirrel.

Besides, we never see our squirrels, though very numerous in the forests, unite together in flocks. Neither do we ever see them travel in company, approach the waters, or traverse rivers on the bark of trees. Thus they differ from the gray squirrel, not only in size and colour, but in manners and habits; for, though the navigations of the gray squirrel seem to be hardly credible, yet they are attested by such a number of witnesses †, that we cannot say absolutely that they are false.

* The Virginian squirrels are nearly of the size of rabbits. They are black, or mixed with black and white. However, the greatest number of them are ash-coloured.—*Descript. des Indes Occident. par Jean Laet*, p. 88. The finest fur brought from the Iroquois country is the skin of the black squirrel. This animal is as large as a cat of three months old; it is extremely vivacious, very gentle, and easily tamed. The Iroquois make robes of this fur, which they sell for seven or eight pistoles.—*Charlevoix, Hist. de la Nov. France*, tom. i. p. 273.

† Rei veritate nititur, quod Gesnerus ex Vincentio Beloacensi et Olao M. referet: sciuros, quando aquam transire cupiunt, lignum levissimum aquæ imponere, eique insidentes, et cauda, non tamen ut vult, erecta, sed continuo mota, velificantes, neque flante vento, sed tranquillo æquore transvehi; quode fide dignus fidusque meus emissiarius ad insulas Gothlandiæ plus simplici vice observavit, et cum spoliis in littoribus ibidem collectis redux, mirabundus mihi retulit.—*Dissertatio de Sciuro volante.*—*Transact. Angl.* No. 427, p. 38.—

Of all the wild quadrupeds, the squirrel is subject, perhaps, to the greatest varieties, or whose species, at least, is approached by the greatest number of neighbouring species. The white squirrel of Siberia *, appears to be only a variety of the common kind. The black † and the deep gray ‡ squirrels of America may be varieties of the gray squirrel. The Barbary, the palm, and the ground squirrels, are three species which make a very near approach to each other.

We have few historical facts concerning the gray squirrel. Fernandes § remarks, that the gray or blackish squirrels of America dwell upon trees, and particularly upon the pine; that they feed upon fruits and seeds; that they amass provisions for the winter, which they deposit in the holes of trees, where they also retire to pass the severe season; that in these holes the females bring forth their young, &c. Thus the manners of the gray squirrel differ from those of the common kind, who build nests, like the birds, on the tops of trees. We cannot, however, pretend to determine absolutely that this blackish squirrel

Klein de Quad. p. 53. Cortice interdum sciurus navigat.—*Linn. Syst. Nat.* p. 63.

* Sciurus albus Sibericus; *L'écureuil blanc de Sibérie.*—*Briss. Regn. Anim.* p. 151.

† Sciurus Mexicanus.—*Hernand. Hist. Mexico,* p. 582. Sciurus niger; *L'écureuil noir.*—*Briss. Regn. Anim.* p. 151.

‡ L'écureuil d'Amerique.—*Seba,* vol. i. p. 78. tab. 48, fig. 5. Sciurus obscure cinereus. Sciurus Americanus.—*Briss. Regn. Anim.* p. 152.

§ Francisci Fernandes.—*Hist. Animal. Nov. Orbis,* p. 8.

of Fernandes is the same with the gray squirrel of Virginia, or that both of them are the same with the gray squirrel of Europe *. We only mention it as a probability; for these three animals are nearly of the same size and colour, inhabit the same climates, have precisely the same figure, and their skins are equally used under the denomination of the *gray fur*, or the fur of the *gray squirrel* †.

* They agree in their manner of feeding with the European kinds, and have all the same sort of attitudes.

W.

† Pennant observes that they are eaten by some people, and are esteemed very delicate. Their skins, in America, are used for ladies' shoes; and are often imported into England for lining or facing for cloaks. *W.*

2784

Plate 107

SIBERIAN GREY SQUIRREL.

THE SIBERIAN GRAY SQUIRREL.

WE have here figured a gray squirrel of Siberia, which the abbé Aubry has preserved in his cabinet, and which differs sufficiently from the gray squirrels of other northern countries for us to presume that they form two distinct species. The ears of this kind are furnished with long hair, the skin is of a clear gray, and the tail white, and rather short: whereas the common gray squirrel has naked ears, the upper part of the body and the sides are of a cinereous gray, and the tail is of the same colour; it is also somewhat larger and thicker in the body, and the tail considerably longer than in the Siberian species.

The hair of this pretty little animal is nine lines in length; it is of a silvery gray colour at the end, and a deep gray at the root. The upper part of the body, the head, the sides, and the base of the tail, are of a uniform gray colour. All the under part of the body, beginning at the lower jaw, is white: above the muzzle, it is gray; but the forehead, the top of the head, and the sides of the cheeks to the ears, are mixed with a light tint of red, which becomes stronger above the eyes and from the lower jaw: the ears before,

are furnished with hair of a deeper gray than that on the body: round, and above the ears, there are long red hairs, which form a sort of bunch, of a quarter of an inch, or five lines, in breadth. The outside of half the fore-legs is of a yellow mixed with cinereous gray: the inner surface is white mixed with a little yellow. The hind-legs, from the ham, and the four feet, are brown mixed with red; it has four toes before and five behind. The hairs of the tail are twenty-one lines long; those at the end are two inches: this white tail, with its long hairs, appears very different from that of our gray squirrel *.

* Latreille thinks that Pallas has mentioned this species in his Travels, and that it is the gray squirrel of Kræsnoiarsk which the Russians call *bielka*. Great numbers of them sometimes arrive, on the approach of autumn, in the countries situated between Mounts Saïana, and Tongouska: this happens when they emigrate from north to south on account of a scarcity of champignons, or cedar-cones, in their own territories. — *Pallas's Travels*, French edition, 8vo. v. p. 70.

W.

Plate 108

Warner Sc.

MADAGASCAR SQUIRREL.

THE MADAGASCAR SQUIRREL*.

A large squirrel inhabits Madagascar, which, in the form of its head, of its body, and other exterior characters, resembles our European species, but it differs in size, in the colour of its hair, and in the length of its tail. It is seventeen inches long from the end of the muzzle to the origin of the tail, whilst the squirrel of our woods is not more than eight inches and three quarters. The head also measures, to the end of the occiput, three inches four lines, while that of our squirrel is not more than two inches. Thus the African squirrel is of a different species from those of Europe and America: besides, the hair is of a deep black. This colour begins on

* CHARACTER SPECIFICUS.

SCIURUS MADAGASCARIENSIS. S. niger, subtus, naso auriculisque albido-flavescentibus, cauda longissima angustata.

L'ECUREUIL DE MADAGASCAR.—*Buff. Hist. Nat. par Sonn.* xxv. p. 178, pl. 5.

MADAGASCAR SQUIRREL.—*Shaw's Gen. Zool.* ii. p. 128.

HABITAT

in Madagascar. *W.*

the nose, extends under the eyes to the ears; covers not only the top of the head and the neck, but also all the upper part of the body, the front of the fore-legs, the thighs, the hind-legs, and the feet: the cheeks, beneath the neck, the breast, and the back part of the fore-legs, are yellowish-white; the belly, and interior surface of the thighs, are brown mingled with a little yellow. The hair of the body is about an inch long. The tail, which is quite black, is remarkably small, and longer than the body, which is not the case in any other species of squirrel. The trunk alone measures sixteen inches and three quarters, independent of the hair, which is two inches long, and forms a plume on the sides of the tail, which gives it a flat appearance in the middle.

2824

GREAT MALABAR SQUIRREL.

THE GREAT MALABAR SQUIRREL*.

THIS squirrel, the skin of which was brought us by M. Sonnerat, is very different from ours, in size and the colours of its body. From the end of the muzzle to the origin of the tail the animal measures fifteen inches six lines, and the tail is of the same length. The body, following its curvature, measures seventeen inches eight lines, and the hairs that cover the ears are differently disposed from those of other squirrels. If, then,

* CHARACTER SPECIFICUS.

SCIURUS MAXIMUS. S. supra ex rubicundo fuscus, subtus niger, cauda nigra, auriculis subbarbatis.—*Linn. Syst. Nat. Gmel.* i. p. 149.—*Schreb.* iv. p. 784, pl. 217, B.

Sciurus (maximus) ferrugineus, subtus flavescens, artubus extus caudaque nigris.—*Shaw's Gen. Zool.* ii. p. 127.

LE GRAND ECUREUIL DE LA COTE DE MALABAR.—*Buff. Hist. Nat. par Sonn.* xxv. p. 180, pl. 4.—*Sonn. Voy. aux Ind.* ii. p. 139, pl. 87.

GREAT SQUIRREL.—*Shaw's Gen. Zool.* ii. p. 127, pl. 146.

HABITAT

in regione Indiæ Mahé, et littore Malabarico.

W.

we compare this squirrel with those of our climate, it is a giant.

The upper part of the head is of a chesnut brown, and forms a great patch, that extends from the forehead to the middle of the nose. The other parts of the head are covered with a fine orange yellow; and the end of the nose is yellow mixed only with a little white. The orange colour prevails also round the eyes and on the cheeks. The ears are covered with rather long and very tufted hair. These hairs, which are eight lines long, look like a brush with the ends cut off. They are of a deep chesnut colour, as well as the band which runs from the ear on the back of the cheek, and all that which covers the occiput. A white band, of unequal size, runs between the ears, and separates the colours of the head from those of the neck. From the occiput arises a very black point, which edges the neck, the legs, and spreads to the shoulders on the deep ferruginous colour which covers all the body and sides, as well as the hind-legs. This same black runs in a stripe along the middle of the back, and spreads on the hind quarters, the thighs, and the tail.

The under part of the lower jaw, the neck, the belly, the thighs, the legs, and the fore-feet, are yellowish-white; but this colour has more of the orange under the belly and the hind-feet. The tail is fifteen inches six lines long, and is covered with very black hairs, which measure two inches three lines.

Finally, this squirrel resembles ours in the

shape of the body, head, and members; the only remarkable difference is in the tail, and the hair which covers the ears*.

* I have substituted the original figure by Sonnerat for that given by the count de Buffon, which is confessedly from a dried skin, and by no means so characteristic of the animal. *W.*

THE COQUALLIN, OR VARIED SQUIRREL*.

THIS animal, which was sent to me from America, under the name of the *orange squirrel*, I recognised to be the same with that which Fernandes calls *qualucallotquapachli*, *coztiocotoquallin* †. But, as these Mexican words are difficult to pronounce, I have abridged the last into

* CHARACTER SPECIFICUS.

SCIURUS VARIEGATUS. S. corpore supra nigro, albo fuscoque variegato.—*Linn. Syst. Nat. Gmel.* i. p. 151.—*Erxleb. Mamm.* p. 421.—*Schreb.* p. 789, pl. 218.

LE COQUALLIN.—*Buff. Hist. Nat. par Sonn.* xxxii. p. 165, pl. 13.

COQUALLIN.—*Shaw's Gen. Zool.* ii. p. 144.

VARIED SQUIRREL.—*Penn. Hist. Quadr.* ii. p. 147.

HABITAT

in Nova Hispania, sub arborum radicibus aliisque in cavernis, in quibus etiam zeae aliorumque cerealium pro hieme penum colligit. *W.*

Squirrel with plain ears; the upper part of the body varied with black, white, and brown, and the belly tawny. It is twice the size of the common squirrel.—*Penn. Synops. Quadr.* p. 285.

† Fernand. Hist Anim. Nov. Hispan. p. 8.

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Plate 110

COQUALLIN.

coquallin. It is not a squirrel, though it resembles that animal in figure, and in bushiness of tail; for it differs from the squirrel, not only in several external characters, but in its dispositions and manners.

The coquallin is much larger than the squirrel: *In duplam fere crescit magnitudinem,* says Fernandes. It is a handsome animal, and its colours are very remarkable. The belly is of a fine yellow colour, and the head, as well as the body, are variegated with white, black, brown, and orange. Like the squirrel, it covers itself with its tail; but it has no pencils of hair at the tips of the ears; it mounts not upon trees; and it dwells, like the ground squirrel, in holes, and under the roots of trees, where it brings forth its young. It lays up grain and fruits for nourishment during the winter. It is timid and crafty, and so wild that it can never be tamed.

The coquallin seems to be peculiar to the South American regions. The white and orange squirrels of the East Indies are much smaller, and their colours are uniform. They are genuine squirrels, which dwell and bring forth upon trees. But the coquallin, and ground squirrel of America, live under the earth, like rabbits, and have no relation to squirrels but what arises from their figure.

THE PALM SQUIRREL*, THE BARBARY SQUIRREL†, AND THE GROUND SQUIRREL‡.

THE palm squirrel is of the size of a rat, or of a small squirrel. He lives upon the palm

* CHARACTER SPECIFICUS.

SCIURUS PALMARUM. S. subgriseus; striis tribus flavicantibus caudaque albo nigroque lineata.—*Linn. Syst. Nat. Gmel.* i. p. 149.—*Schreb.* iv. p. 802, pl. 220.—*Erxleb. Mamm.* p. 423.

SCIURUS PALMARUM (mus palmarum vulgo), coloris ex rufo et nigro mixti, tæniis in dorso flavicantibus.—*Briss. Quadr.* No. 10. p. 156.

MUSTELA AFRICANA.—*Clus. Exot.* p. 112.—*Jonst. Quadr.* p. 153.—*Ray's Quadr.* p. 216.

LA PALMISTE.—*Buff. Hist. Nat. par Son.* xxvii. p. 189, pl. 11.

PALM SQUIRREL.—*Penn. Hist. Quadr.* ii. p. 149; *Shaw's Gen. Zool.* ii. p. 146.

HABITAT

in Asia et Africa, num et in America? Cic certe Linné putat. In arboribus præcipue Palmis degit: nuces cocos præcipue amans. *W.*

The palm squirrel has plain ears, an obscure pale yellow stripe on the middle of the back, another on each side, a third on each side of the belly, the two last being very distinct. The rest of the hair on the sides, back, and head, is black and red, very closely mixed; that on the thighs and legs is more

288A

Plate 111

PALM SQUIRREL.

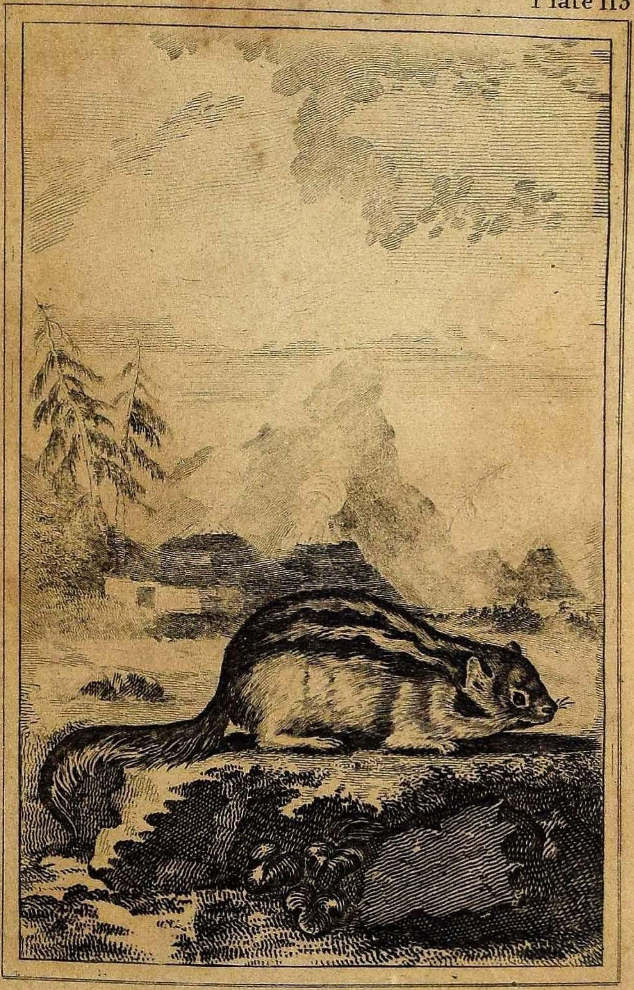
288 B

Plate 112

BARBARY SQUIRREL.

288c

Plate 113



GROUND SQUIRREL.

trees, and from that circumstance he has had his name. By some he is called the *palm rat*, and

red. The belly is of a pale yellow. The hair on the tail does not lie flat, but encircles it; it is coarse, and of a dirty yellow, barred with black. — *Penn. Synops. Quadr.* p. 287.

† CHARACTER SPECIFICUS.

SCIURUS GETULUS. S. fuscus, striis quatuor albidis longitudinalibus. — *Linn. Syst. Nat. Gmel.* i. p. 150. — *Schreb.* iv. p. 806, pl. 221.

SCIURUS GETULUS. S. coloris ex rufo et nigro mixti, tæniis in lateribus alternatim albis et fuscis aut nigris. — *Briss. Quadr.* p. 157, No. 11.

SCIURUS GETULUS. — *Aldrov.* p. 405 — *Gesn. Quadr.* p. 112. — *Jonst. Quadr.* p. 163, pl. 67. — *Ray's Quadr.* p. 216.

LE BARBARESQUE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 189, pl. 13.

WHITE-STRIPED SQUIRREL. — *Penn. Hist. Quadr.* ii. p. 150.

BARBARIAN SQUIRREL. — *Edwards*, p. 198.

BARBARY SQUIRREL. — *Shaw's Gen. Zool.* ii. p. 146, pl. 148.

HABITAT

in Barbariæ littore occidentali. *W.*

The Barbary squirrel has full black eyes, and white orbits. The head, body, feet, and tail, are cinereous, inclining to red. The colour is lightest on the legs. The sides are marked lengthwise with two white stripes. The belly is white. The tail is bushy, marked regularly with shades of black, one beneath another. It is of the size of the common squirrel. — *Penn. Synops. Quadr.* p. 287.

‡ CHARACTER SPECIFICUS.

SCIURUS STRIATUS. S. flavus, striis quinque fuscis longitudinalibus. — *Linn. Syst. Nat. Gmel.* i. p. 150. — *Erxleb. Mamm.* p. 426.

SCIURUS STRIATUS. S. fusco-flavescens, striis quinque longitudinalibus nigricantibus. — *Shaw's Gen. Zool.* ii. p. 149.

by others the *palm squirrel*. But, as he is neither a rat nor a squirrel, we have given him the simple denomination of *le palmiste*. The form of his head is nearly the same with that of the short-tailed field-mouse, and covered with frizzled hair. His long tail trails not, like that of the rat, but is elevated vertically, without, however, lying on his back, like that of the squirrel. The tail is covered with hair longer than that of the body, but shorter than the hair on the tail of a squirrel. Along the spine of the back, from the neck to the tail, there is a whitish stripe, accom-

SCIURUS CAROLINENSIS. — *Briss. Quadr.* p. 155, No. 9.

LE SUISSE *. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 189, pl. 13.

GROUND SQUIRREL. — *Catesby's Carol.* ii. pl. 75. — *Law's Carol.* p. 124. — *Edwards*, pl. 181.

STRIPED DORMOUSE. — *Penn. Hist. Quadr.* ii. p. 157.

STRIPED SQUIRREL. — *Shaw's Gen. Zool.* ii. p. 149, pl. 148.

HABITAT

in America septentrionali, nec non in Asia boreali copiosus, sub terra, canáli longo bifori cum concamerationibus lateralibus pluribus distinctis pro singula messe. Rarissime arbores ascendit. *W.*

The ground squirrel has plain ears. The ridge of the back is marked with a pale yellow stripe, bounded above and below with a line of black. The head, body, and tail, are of a reddish-brown colour; the tail is darkest. The breast and belly are white, and the nose and feet pale red. The eyes are full. — *Penn. Synops. Quadr.* p. 288.

* So called, according to Charlevoix, from their skins being rayed with black and white, like the breeches of the Switzers, who form the pope's guard. *W.*

panied on each side with a brown stripe, which is followed by another white stripe. This striking character, by which this animal would appear to be distinguished from all others, is found to be nearly the same in the Barbary and ground squirrels. These three animals have such a resemblance to each other, that Mr. Ray* imagined they constituted but one species. If it be considered, however, that the palm and Barbary squirrels are only found in the warm climates of the Old Continent, and that the ground squirrel, described by Lister, Catesby †, and Edwards ‡, is peculiar to the cold and temperate regions of the New World, we must conclude them to be different species. By a closer examination, we perceive that the white and brown stripes of the ground squirrel are differently disposed from those of the palm squirrel. In the palm squirrel, the white stripe, which extends along the spine of the back, is black or brown on the ground squirrel, and the white stripes are placed next the black, as the black are next the white in the palm squirrel. Besides, the palm squirrel has only three white stripes; but the ground squirrel has four. The latter turns his tail upon his back, but the former

* Sciurus getulus Caii, mustela Africana Clusii, eadem nobis videtur. —— Descriptio mustelæ Africanæ cum sciuri getuli descriptione satis bene convenit, ut non dubitem idem animal esse: huic similis est sciurus a clarissimo *Dom. Lister* observatus et descriptus. — *Ray's Synops. Quadr.* p. 216.

† Catesby, Hist. Nat. de la Caroline, tom. ii. p. 75.

‡ Edwards, Nat. Hist. of Birds, part iv. p. 181.

does not. The palm squirrel dwells upon trees; but the ground squirrel keeps always on the surface of the earth, and from this circumstance he has obtained his name. In fine, the ground squirrel is smaller than the palm squirrel: from all these considerations, they appear to be two distinct species.

We are assured that the palm squirrel is common in Senegal, in the country of the Jalof negroes, and in the lands bordering on Cape Verd. It frequents inhabited places, and it also oftener lives in the bushes than on the palm trees. They are very lively little animals; we frequently see them, in the day-time, cross the roads to go from bush to bush, and they remain on the ground at least as often as they do upon the trees.

With regard to the Barbary squirrel, as it is a native of the same continent and climate, as it is of the same size, and nearly of the same figure, with the palm squirrel, they might be considered as varieties of the same species. By comparing, however, the description and figure of the Barbary squirrel given by Caius *, and copied by Aldrovandus † and Johnston ‡, with the description and figure we have given of the palm squirrel, and by again comparing Edwards's description and figure of the Barbary squirrel, we shall perceive distinctions so remarkable as to point

* Sciurus getulus *Caii, apud Gesner, Hist. Quadr.* p. 847.
† Aldrov. de Quadr. Digit. p. 405.
‡ Johns. de Quadr. p. 113.

out these animals as belonging to different species. All the three are in the royal cabinet. In the Barbary squirrel, the head and face are rounder, the ears larger, and the hair of the tail longer and more bushy, than in the palm squirrel. In the form of the head and body, the Barbary squirrel resembles the squirrel more than the rat, and the palm squirrel resembles the rat more than the squirrel. The Barbary squirrel has four white stripes, the palm squirrel only three. In the palm squirrel, the middle white stripe runs along the spine of the back; but, in the Barbary squirrel, the stripe along the back is black mixed with red, &c. Besides, these animals have nearly the same manners and dispositions as the common squirrels: they all feed upon fruits, which they carry to their mouth by their fore-paws. They have the same voice and cry, the same instinct and agility. They are extremely gentle and lively. They are easily tamed, and contract such an attachment to their habitation, that, after leaving it, they spontaneously return. The figure of both is handsome. Their robe, which is striped with white, is more beautiful than that of the squirrel; their size is smaller, their body lighter, and their movements equally prompt. Like the common squirrel, the palm and Barbary squirrels dwell on the tops of trees; but the ground squirrel never rises from the earth, in which, like the long-tailed field-mouse, he makes a retreat impenetrable by the water. Unless completely tamed, he bites every

person indiscriminately *. Hence, in manners and dispositions, he has a greater resemblance to the rats and field-mice than to the squirrels †.

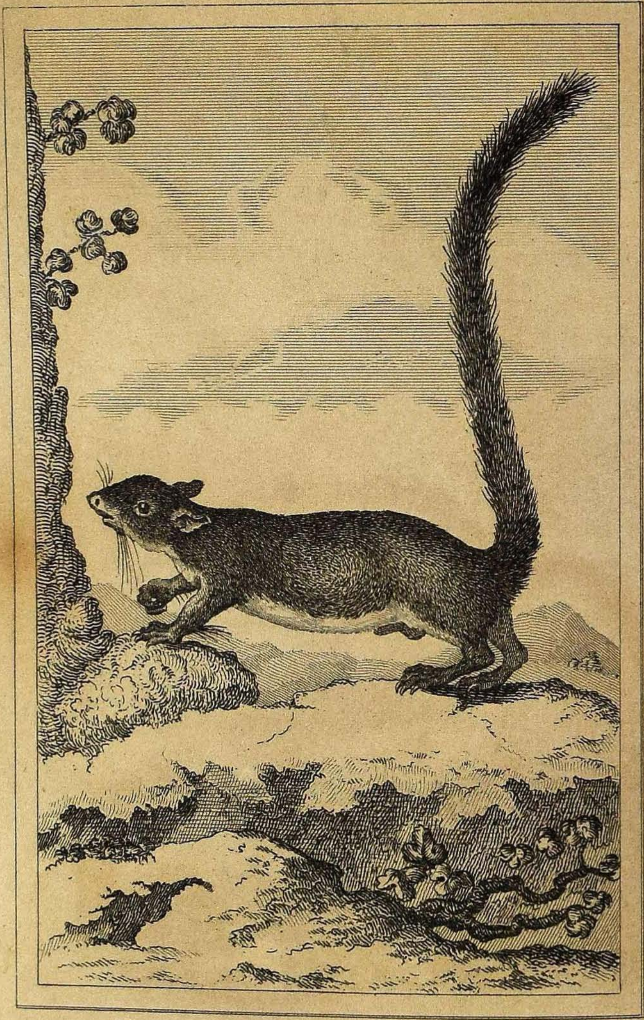
* Voyage du Pays des Hurons, par Sagard Theodat, p. 306.

† Dr. Shaw has given the following account of these animals, chiefly collected from the observations of professor Pallas. The ground squirrels are extremely common in Siberia, inhabiting the maple and birch woods of that country, and generally forming their nests or burrows near the root of some tree: they are never known to ascend trees in the manner of other squirrels, unless suddenly surprised or pursued, when they climb with great expedition, and conceal themselves among the branches: they collect their stores during the autumnal season, and on the setting in of winter conceal themselves in their burrows, the entrances of which they stop; and pass the greatest part of the rigorous season in sleep, and in feeding on their collected stores: but if, by an unusual continuance of severe weather, their provisions happen to fail, they then sally out in quest of fresh supplies, and occasionally make their way into granaries, and even into houses. In the choice of their food they are remarkably nice, and have been observed, after filling their pouches with rye, to fling it out on meeting with wheat, and replace it with the superior grain. They are of a wild nature, and are by no means easily reconciled to a state of captivity; continuing timid, and showing no symptoms of attachment to their owners. They are taken merely on account of their skins, which, though forming but a slight or ordinary fur, have a very pleasing appearance when properly disposed, and are said to be chiefly sold to the Chinese. It has been doubted, whether those found in America, be really of the same species with the European or Asiatic kind; but the differences are by no means such as to justify a specific distinction; consisting merely in a very trifling variation of size and colours. — *Gen. Zool.* ii. p. 150.

W.

2941

Plate 114



GREAT GUERLINGUET.

294 B

LITTLE GUERLINGUET.

THE GUERLINGUETS*.

THERE are two species or constant varieties of these little animals in Guiana, where they have acquired their name. The first, which we have figured under the name of *great guerlinguet*, is more than twice as large as the second, which we have called *little guerlinguet*. Both were given us by M. Sonnini de Manoncourt, and we have discovered that they are the same animals which M. de la Borde mentioned to us by the name of squirrel. I have justly said that I was not certain that this animal was a true squirrel, because the squirrels are not found in very hot climates. In effect, I have been since informed that there is no species of true squirrel in Guiana. The animal they call guerlinguet, indeed, resembles the European squirrel in the shape of its head, in the teeth, and the habit of curling its tail on its back; but it differs in being longer and less tufted, and in general its body is not of the same form or proportions as that of our squirrel. The little species of guerlinguet, which differs from the great only in being half the size, is still farther removed from our squirrel. They have also given this little animal another name,

* Les Guerlinguets. — *Buff. par Sonn.* xxvii. p. 198, pl. 14.

for they call it the *wood-rat* at Cayenne, because in reality it is not bigger than a rat. The other guerlinguet is nearly of the same size as our French squirrels; but its hair is shorter and less ferruginous, and the little guerlinguet has still shorter hair, and the tail is not so well furnished as the former: both live on the fruit of the palm-tree; they climb the trees very slowly, where, however, they do not remain constantly, for they are often seen to run on the ground.

The following is the description of these two animals.

The great male guerlinguet has no bunch of hairs at the ears, like the squirrels; its tail does not form a plume, it is smaller, being but seven inches five lines from the end of the nose to the origin of the tail, while the squirrel of our woods is eight inches six lines. The hair is of a tawny brown at the root, and deeper at the tip; it is only four lines long: it is of a chesnut brown on the head, the body, the exterior of the legs, and the tail; and of a paler red on the neck, the breast, the belly, and inside of the legs: it is also gray and yellowish-white under the jaw, and the neck; but the pale red prevails on the breast and on one part of the belly, and this orange-coloured hair is mixed with gray shades on the inside of the thighs. The whiskers are black, and one inch nine lines long. The tail also is as long as the body, being seven inches five lines: therefore it is longer in proportion than that of the European squirrel: it is rather flat than round, and nearly equally thick throughout; the hair which covers it is from ten

to eleven lines long, and it is rayed, as it were, with indistinct bands of tawny brown; it is tipped with black hairs. There is also on the interior of the fore-arm, near the wrist, a bundle of seven or eight black hairs, which are seven lines long, and this character is wanting in our squirrels.

The little guerlinguet measures only four inches three lines from the end of the nose to the origin of the tail, which, being but three inches three lines long, is much shorter in proportion than that of the great guerlinguet; but otherwise, these two animals perfectly resemble each other in the shape of the head, the body, and the limbs: the hair only of the little guerlinguet is not so brown; the body, legs, and tail, are shaded with olive and ash colour, because the hair, which is only two lines long, is ash-brown at the roots, and tawny at the tip. The deep tawny prevails on the head, the belly, and the interior of the thighs; the ears are garnished with tawny hairs within, while those of the great guerlinguet are naked, the whiskers are black, and composed of very supple hairs, of which the longest measure thirteen lines: the legs and feet are covered with a little tawny hair; the nails, which are blackish, are large at the base, and crooked at the end, nearly like those of cats. The breast and upper part of the belly, are mouse-gray mixed with red, while, in the great guerlinguet, these same parts are of a red, faint and whitish. The hairs of the tail are mixed with brown and tawny. The testicles of this little guerlinguet were much

larger than those of the great guerlinguet, in proportion to its body, although these parts were in the great guerlinguet of the same size as in our squirrels*.

* Pennant, and, after him, Dr. Shaw, have placed the guerlinguet among the dormice: it is the *Myoxus Guerlingus* of the latter author, but it is not as yet clearly ascertained to what genus it properly belongs.

W.

THE RAT*.

NATURE, by descending gradually from great to small, from strong to weak, counter-balances every part of her works. Attentive

* MUS.

CHARACTER GENERICUS.

Dentes primores superiores cuneati.
Molares utrinque tres, rarius duo.
Claviculæ perfectæ.

CHARACTER SPECIFICUS.

Mus Rattus. M. cauda longissima squamosa, corpore atro, subtus canescente.—*Linn. Syst. Nat. Gmel.* i. p. 127.—*Schreb.* iv. pl. 179.

Mus Rattus. M. cauda elongata, palmis tetradactylis cum unguiculo pollicari, corpore griseo.—*Erxleb. Mamm.* p. 382.

Mus (rattus) cauda longissima, obscure cinereus.—*Briss. Quadr.* p. 168, No. 1.

Mus domesticus major.—*Gesn. Quadr.* p. 731.—*Aldrov.* p. 415.—*Ray's Quadr.* p. 217.

Glis.—*Jonst. Quadr.* t. 66.

Le Rat.—*Buff. Hist. Nat. par Sonn.* xxv. p. 184, pl. 6.

Black Rat.—*Penn. Hist. Quadr.* ii. p. 176.—*Shaw's Gen. Zool.* ii. p. 52.

HABITAT

in Persia et India; nunc etiam, boreali parte excepta, in Europa; ex qua per naves in Africam et Americam delata

solely to the preservation of each species, she creates a profusion of individuals, and supports by numbers the small and the feeble, whom she hath left unprovided with arms or with courage. She has not only put those inferior animals in a condition to perpetuate and resist by their own numbers, but she seems, at the same time, to have afforded a supply to each by multiplying the neighbouring species. The rat, the mouse, the field-mouse, the water-rat, the short-tailed field-mouse, the fat squirrel, the garden squirrel, the dormouse, the shrew-mouse, and several others, which I mention not, because they do not belong to our climate, form so many distinct and separate species, but so analogous to each other, that if any one should happen to fail, the gap in the genus would hardly be perceptible. It is this great number of neighbouring species which hath given to naturalists the idea of genera; an idea which can only be employed when we view objects in general, but which vanishes whenever we consider Nature in detail.

esse fertur: in Tahiti tamen frequens, rarior in reliquis maris australis insulis. *W.*

The rat has two cutting teeth in each jaw, four toes before, five behind, and a slender taper tail, naked or very slightly haired. It is of a deep iron-gray colour, nearly black; the belly is cineritious, and the legs dusky and almost naked. There is a claw in place of a fifth toe, on the fore-feet. Its length is seven inches, and that of the tail near eight.—*Penn. Synops. Quadr.* p. 299.

In Greek, Μυς; in Latin, *Mus major, Rattus*; in Italian, *Rato di casa*; in Spanish, *Raton*; in German, *Ratz*; in Swedish, *Rotta*; in Polish, *Sczurcz*; in French, *Le Rat.*

Men at first gave distinct names to objects which appeared to differ from each other; and, at the same time, they gave general denominations to objects that seemed to be nearly similar. Among a rude people, and in the infancy of all languages, there is hardly any thing but general terms, or vague and ill-formed expressions for objects of the same order, though very different from each other. An oak, a beech, a linden-tree, a fir, a pine, a yew, would, at first, have no other name but that of a *tree*; afterwards the oak, the beech, and the yew, would all be called *oak*; when these were distinguished from the fir, the pine, and the yew, the three latter would be called *fir*. Particular names could only be invented in consequence of a minute examination of each different species; and the numbers of these names are augmented in proportion to the extent of our knowledge of Nature: the more we examine her, proper and particular names will become more frequent. When natural objects, therefore, are represented to us under general denominations, or by classes and genera, it is recalling the darkness peculiar to the infant state of human knowledge. Ignorance is the parent of genera; but science will for ever continue to create and to multiply proper names; and I shall never hesitate in adding to their number, as often as I have occasion to delineate different species.

Several species of small animals have been confounded under the generic name of *rat*: but we shall confine this name solely to the common

rat, which is of a blackish colour, and infests the habitations of men. The rat commonly frequents granaries and barns, and from thence, when food is scarce, comes into our houses. He is a carnivorous, or rather an omnivorous animal: he seems only to prefer hard substances to those which are tender or succulent. He gnaws linen, cloths, furniture, makes holes in the walls, lodges in the ceilings, and in the void spaces between the wall and the wainscoting. From these lurking places the rats issue in quest of food, and transport thither every substance they can drag, forming considerable magazines, especially when they have young to provide for. The female brings forth several times a year, but always in the summer season. The litter generally consists of five or six. They are fond of warmth, and, in winter, insinuate themselves near the chimneys, or lodge among hay or straw: in spite of cats, poison, and snares, these animals multiply so greatly, that they often do much damage. In old country-houses, where grain is kept, and where the vicinity of barns and magazines of hay facilitates their retreat, they often increase so prodigiously, that the possessors are obliged to remove and desert their habitations, unless the rats happen to destroy each other. It is well known, that rats, when pinched for food, eat one another. When a famine is created by too great a number being crowded into one place, the strong kill the weak, open their heads, and first eat the brain, and then the rest of the body. Next day, the war is

renewed, and continues in the same manner till most of them are destroyed. This is the reason why these animals, after being extremely troublesome, disappear all of a sudden, and return not for a long time. The same thing happens to field-mice, whose prodigious multiplication is interrupted only by the hostilities they exercise on each other, when provisions become scarce. This sudden destruction is ascribed by Aristotle to the operation of rains. But rats are not exposed to rain, and the field-mice know how to guard themselves against its effects; for the holes they inhabit are not even moist.

The rats are as lascivious as they are voracious: they squeak during their amours, and cry when they fight. They prepare a bed for their young, and soon learn them to eat. When the young begin to issue from their hole, the mother watches, defends, and even fights with the cats in order to save them. A large rat is more mischeivous, and nearly as strong, as a young cat. The fore-teeth of the rat are long and strong: the cat is not a good biter; and, as she uses her claws only, she requires to be both vigorous and accustomed to fight. The weesel, though smaller, is a more dangerous and formidable enemy, because he follows the rat into his hole. Their strength being nearly equal, the combat often continues long: but the method of using their arms is very different. The rat wounds only by reiterated strokes with his fore-teeth, which are rather destined for gnawing than

biting; and, being situated at the extremity of the lever or jaw, they have not much force. But the weesel bites cruelly with the whole jaw, and, instead of quitting his hold, he sucks the blood from the wounded part; and, therefore, the rat uniformly falls a sacrifice to the weesel.

Of this species, as in all those which consist of numerous individuals, there are many varieties. Beside the common rat, which is blackish, some are brown, others gray, reddish, and even totally white. The white rats have red eyes, like the white rabbit, the white mouse, and all the other animals which are perfectly white. The whole species, and its varieties, appear to be natives of temperate climates, and are more diffused over the warm than the cold regions. There were no rats originally in America *; but those imported from Europe multiplied so prodigiously, that they were long the scourge of the colonies, where they had no enemies but large serpents, which swallowed the rats alive. They have been carried by ships into the East Indies, and all the islands of the Indian Archipelago †; and are found likewise in Africa ‡. But, towards the north, they have never multiplied beyond Sweden; for what

* See la Descript, des Antilles, par le P. du Tertre, tom. ii. p. 303; l'Hist. Nat. des Antilles, p. 261; Nouveaux Voyages aux Isles de l'Amerique, tom. iii. p. 160; Dampier, tom. iv. p. 225.

† Lettres Edifiantes, Recueil xviii. p. 161.

‡ Voyage de Guinée par Bosman, p. 241; l'Hist. Gen. des Voyages, par M. l'Abbé Prevot, tom. iv. p. 238.

are called Norwegian and Lapland rats, are animals of a different species.

Pontoppidan remarks, "that neither the wood nor water-rats can live farther north than Norway; that there are several districts, as that of Hordenver, in the diocese of Bergen; and others, in the diocese of Aggerhum, where no rats are to be found; and that the rats on the south banks of the river Vormen soon perish when carried to the north side of it. This difference," he adds, "can only be ascribed to certain exhalations of the soil, which are destructive to these animals." These facts may be true: but we have often discovered that Pontoppidan is an author who deserves not entire credit.

M. le Viconite Querhöent has favoured me with the following remarks: that the rats, transported from Europe to the Isle of France, increased to such a degree, that, it is alleged, they made the Dutch leave the island. The French have diminished the number, though great quantities of them still remain. Some time, adds M. de Querhöent, after a rat resides in India, he acquires so strong a smell of musk, that he scents every thing for a considerable space round his habitation; and it is alleged, that, when he comes near wine, he makes it turn sour.—This Indian rat appears to be the same which the Portuguese call *cheroso*, or odoriferous rat. La Boullaye-le-Gouz says, "that it is very small, and nearly of the figure of the ferret; that its bite is venomous; that its smell is immediately perceived when

it enters a chamber; and that it cries *kric, kric, kric* *."

This rat is likewise found in Madura, where it is called the *scented rat.* It is mentioned by the Dutch voyagers, who tell us, that its skin is as fine as that of the mole, but not so black † ‡.

Abundance of rats are also found in Africa §. In the north, on the contrary, they scarcely propagate beyond Sweden; and what we call Norway, Lapland rats, &c., are different animals from our rats.

Rats appear to exist in every country inhabited or frequented by mankind; for, from the account of voyagers, they have been found every where, and even in newly discovered countries. Mr. Forster says, that the rat is found in the South Sea islands, and in the country of New Zealand; that there are a prodigious quantity in the Society islands, and especially at Taiti: where they live on the remains of the food which the natives leave in their huts, on the flowers and seed vessels of the *Erythrina corallodendrum*, on bananas and other

* Voyage de la Boullaye-le-Gouz, p. 256.

† Recueil des Voyages qui ont servi à l'Etablissement de la Comp. des Indes Orient. tom. ii. p. 275.

‡ M. Morand, a gentleman of the faculty at Paris, has noticed a remarkable disposition in the rat to form stones. Ten or twenty rats which he examined, were attacked by this disease. It is more frequently met with in males than in females; and almost all the old rats have either stones in their bladders, or diseased kidneys. *W.*

§ See Bosman's Guinea, and Hist. Gen. des Voyages, tom. iv. p. 238.

fruits; and, when these are wanting, on excrements of all sorts. They are even sometimes bold enough to gnaw the feet of the sleeping natives. They are much rarer in the Marquisas and Friendly islands, and we rarely see them in the New Hebrides *.

It is singular enough that the species of our rats have been found in the South Sea islands; while, in the whole extent of the American continent, these same species are not to be met with; and that all the rats which actually exist in the New Continent, have been carried there by our vessels.

According to M. de Pages †, there is, in the deserts of Arabia, a species of rat very different from any we are acquainted with. "Their eyes," says he, "are large and lively: their whiskers, their snout, and the top of the forehead are white, as well as the belly, the feet, and the end of the tail: the rest of the body is yellow, and the hair long and very clean: the tail is moderately long; but it is thick, and of a yellow colour like the body, and tipped with white. My Arabian companions eat these rats, after they have killed them with a stick, which they throw with great address in the way of a quadruped, or of a bird, that they wish to hit."

* Cook's second Voyage.

† Voyage autour du Monde, manuscrit, par M. de Pages.

THE BROWN RAT*.

TO this species of rat, which has been known for a few years past only, I have given the appellation of *surmulot*. This animal is mentioned

* CHARACTER SPECIFICUS.

Mus Decumanus. M. cauda longissima squamata, corpore setoso griseo subtus albido. — *Linn. Syst. Nat. Gmel.* i. p. 127. — *Schreb.* iv. p. 645, pl. 178.

Mus Norwegicus. M. cauda elongata, palmis tetradactylis cum unguiculo pollicari, corpore rufo. — *Erxleb. Mamm.* p. 381.

Mus Sylvestris. M. cauda longissima, supra dilute fulvus, infra albicans. — *Briss. Quadr.* p. 170, No. 3.

Mus Aquaticus. — *Gesn. Aquat.* p. 732.

Le Surmulot. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 27, pl. 3.

Norway Rat. — *Shaw's Gen. Zool.* ii. p. 51. pl. 130.

Brown Rat. — *Penn. Hist. Quadr.* ii. p. 178. — *Brit. Zool.* i. No. 26.

HABITAT

hodie fere in omni Europa, a seculo nostro inde, borealis originis. In Anglia ignotus ante annum 1730, in Gallia ante 1750. Degit præcipue ad aquas, beneque natat et urinatur. Fodit subterraneus, et reperitur quoque in domibus.

W.

Rat with the head, back, and sides, of a light brown colour, mixed with tawny and ash-colour; breast and belly dirty white; feet naked, and of a dirty flesh-colour; fore-feet

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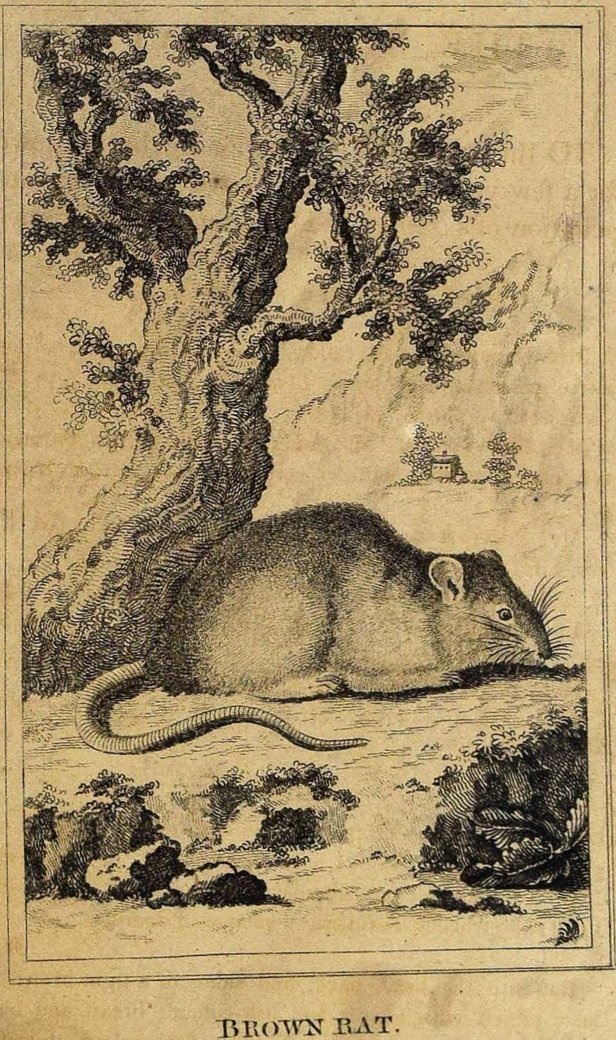
Plate 116



BROWN RAT.

by no naturalist, except Mr. Brisson, who calls it the *wood-rat.* It is larger and more mischievous than the common rat. It has reddish hair, a very long naked tail, and the spine of the back arched like that of the squirrel. Its body is likewise thicker; and it has whiskers like a cat. It is not above nine or ten years since this species was diffused through the environs of Paris. From whence these animals came, is uncertain *; but they have multiplied prodigiously. Neither is this wonderful, when we consider that they generally produce from twelve to fifteen young at a litter, and sometimes even nineteen. They were first discovered at Chantilly, Marly-la-Ville, and Versailles, where they committed great ravages. M. le Roy favoured me with great numbers of them, both living and dead, and communicated to me the remarks he had made upon this new species. The males are larger, stronger, and more mischievous than the females. When hard pursued, or when we attempt to seize them, they face about, and bite the stick or the hand that strikes them. Their bite is not only cruel, but dangerous; for it is instantly followed by a considerable swelling, and the wound, though small, does not soon heal. The females bring forth three times a year: hence two individuals

furnished with four toes, and a claw instead of the fifth; length from nose to tail nine inches; tail the same; weight eleven ounces; is stronger made than the common or black rat.—*Penn. Synops. Quadr.* p. 300.

* We have reason to believe they were originally brought in ships from the East Indies. *W.*

of this species may produce at least thirty-six young in twelve months. The mothers prepare a bed for their offspring. Some of the females sent us, which we kept in cages, were with young; and, two or three days before they brought forth, we observed that they gnawed the wood of the cages, and made of the cuttings, which were in considerable quantities, a convenient bed for their little ones.

The brown rats have some qualities which make them approach to the nature of the water-rat. Though every where diffused, they seem to prefer the banks of waters. The dogs pursue them with the same remarkable fury as they chase the water-rat. When pursued, and they find it equally easy to take to the water, or to conceal themselves in brushwood, they choose the water, enter it without fear, and swim with great dexterity and ease. This phænomenon is chiefly exhibited when they cannot regain their holes; for, like the long-tailed field-mouse, they dig subterraneous retreats, or rather, they nestle in those made by the rabbits. The brown rats may be taken in their holes by ferrets, which pursue them with equal ardour as they do the rabbit.

These animals pass the summer in the country: and though they feed principally upon fruits and grain, they eat young hares, partridges, and fowls. When they enter a hen-house, like the polecat, they kill more than they can eat. Towards the month of November, the mother and all the young quit the fields, and come in troops into the barns, where they do infinite mis-

chief, by mincing the straw, consuming the grain, and infecting every thing with their ordure. The old males remain in the fields, each inhabiting his own hole, where, like the field-mice, they amass acorns, beach-mast, &c., filling the holes to the top, and remaining themselves at the bottom. They sleep not, like the dormouse; but go out in winter, especially when the weather is mild. Those who take up their abode in barns, banish all the mice and rats. It has even been remarked, that, since the multiplication of the brown rat about Paris, the common rats are much less frequent *.

* Pennant remarks, that the brown rat, since its appearance in England, has quite extirpated the common kind wherever it has taken its residence; and it is to be feared that we shall scarce find any benefit by the change; this species having the same disposition, with greater abilities for doing mischief, than the common kind.

W.

THE POUCH RAT*.

RZACZYNSKI mentions an animal that the Russians call *pouch:* it is larger than the domestic rat; has an oblong muzzle; burrows underground, and makes great havoc in cultivated lands: they were so numerous near Suras, in Volhynia, that the inhabitants were obliged to leave their gardens uncultivated. The *pouch* appears to be the same animal that Seba has called the Norway rat, which he has described and figured †.

* Auctuarium, Hist. Nat. Poloniæ, Gabriele Rzaczynski.

† The short account which Buffon has given of this animal leads us to believe that it is merely a variety of the brown rat, and by no means a distinct species.

W.

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Plate 117

Warner Sc

PERCHAL RAT.

THE PERCHAL RAT*.

THIS rat, of which M. Sonnerat brought us the skin, under the name of perchal rat, is larger than our common species. It is longer than our rats; the naked ears are of the usual shape and colour. The legs are short, and the hind-feet very large when compared with those before; since from the heel to the end of the claws measures two inches, while the fore-feet, from the wrist to the same point, measure only ten lines. The tail, which resembles that of the common rat, is shorter in proportion, although that is not more than eight inches three lines in length.

The hair on the upper part of the head, on the neck, on the shoulders, on the back to the crupper, and on the superior part of the sides, is of a

* CHARACTER SPECIFICUS.

MUS PERCHAL. M. fusco-ferrugineus, subtus cinereus, pedibus posterioribus majoribus.—*Shaw's Gen. Zool.* ii. p. 55.

LE RAT PERCHAL.—*Buff. Hist. Nat. par Sonn.* xxv. p. 197, pl. 6.

PERCHAL RAT.—*Shaw's Gen. Zool.* ii. p. 55.

HABITAT

in Indiæ. W.

deep musk-brown colour; the rest of the body is of a clearer gray. The whiskers are black, and two inches six lines long; the tail is scaly, ringed, and of a grayish-brown colour.

The hairs on the body are eleven lines long; those on the crupper, two inches: they are gray at the root and brown at the end: there are mixtures of other gray hairs in abundance under the belly and the sides.

This rat is very common in India. It inhabits the houses in Pondicherry, like the common rat in Europe, and the natives of that town reckon it good eating.

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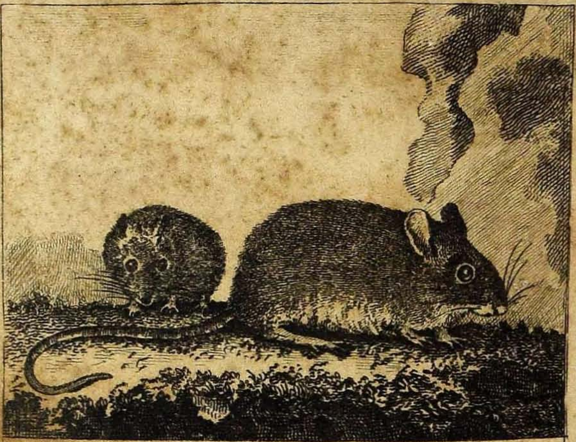

LONG-TAILD FIELD MOUSE.

WATER RAT.

THE WATER-RAT*.

THIS animal is about the size of a rat; but, from its manners and dispositions, has a much gerater resemblance to the otter than to the com-

* CHARACTER SPECIFICUS.

Mus Amphibius. M. cauda longitudine dimidia corporis, auribus vix vellere prominulis, pedibus subtetradactylis.—*Linn. Syst. Nat. Gmel.* i. p. 132.—*Schreb.* iv. p. 668, t. 186.

Mus cauda mediocri, palmis tetradactylis cum unguiculo pollicari, corpore nigricante.—*Erxleb. Mamm.* p 386.

Mus Aquaticus. M. cauda longa, pilis supra e nigro et flavescente mixtis, infra cinereis vestitus.—*Briss. Quadr.* p. 175.

Mus Agrestis Major.—*Gesn.* p. 733.

Mus Major Aquaticus.—*Ray's Quadr.* p. 217, 219.

Le Rat d'Eau.—*Buff. Hist. Nat. par Sonn.* xxv. p. 214, pl. 7, fig. 2.

Water-Rat.—*Penn. Hist. Quadr.* ii. p. 182.—*Brit. Zool.* i. No. 27.—*Shaw's Gen. Zool.* ii. p. 73, pl. 129.—*Bew. Quadr.* p. 380.

HABITAT

in Europa et America boreali, ad aquas, fodiens.

W.

Rat with a thick blunt nose; ears hid in the fur; eyes small; teeth yellow: on each foot five toes; inner toe of the fore-foot very small; the first joint very flexible: head and

mon rat. Like the otter, he frequents the fresh water, and is found in the margins of rivers, brooks, and pools, and lives mostly on fishes. Gudgeons, minnows, blays, and the fry of carps, pikes, and barbels, are his ordinary food. He likewise eats frogs, water insects, and sometimes the roots of plants. He has not, like the otter, membranes between his toes. This error has been copied from Willoughby, by Ray and other naturalists. Though all his toes be separate, he swims with ease, keeps long under the water, and carries off his prey to be devoured upon the grass, or in his hole. He is sometimes surprised by fishers when searching for craw-fish; and he endeavours to escape by biting their fingers, or leaping into the water. His head is shorter, his muzzle thicker, his hair more bushy, and his tail much shorter than that of the rat. Like the otter, he avoids large rivers, or rather those which are much frequented. He never visits houses or barns, but keeps upon the margins of waters, from which he wanders not upon dry land so far as the otter, which is sometimes found at the distance of a league from water. Water-rats are seldom met with in elevated places, or in dry

body covered with long hairs, black mixed with a few ferruginous hairs: belly of an iron gray; tail covered with short black hairs, the tip whitish: weight nine ounces; length, from nose to tail, seven inches; tail only five.—*Penn. Synops. Quadr.* p. 301.

In Latin, *Mus aquaticus, Mus aquatilis*; in Italian, *Sorgo morgange*; in German, *Wasser-musz*; in Polish, *Myss wodna*; in French, *Le Rat d'Eau.*

plains, but are extremely numerous in moist and marshy valleys. The females come in season about the end of winter, and bring forth in the month of April, the litter generally consisting of six or seven. Perhaps they bring forth more than once a year; but of this we have no proper knowledge. Their flesh is not intolerably bad, being eaten by the peasants, as well as that of the otter, during the season of Lent. They are found every where over Europe, except in the polar regions. If we may credit Bellon, they inhabit the banks of the Nile: however, the figure he gives of them has so little resemblance to our water-rat, that it is probable the Nile rats form a different species of animals.

The European water-rat is found in Canada, but of different colours; it is brown only on the back, the rest of the body is white, and in several places yellow; the head and the muzzle also are white as well as the end of the tail: the hair appears softer and more glossy than that of our water-rat; in other respects they are alike; and it can hardly be doubted, that the two animals are of the same species. The white hair is owing to the coldness of the climate, and it may be presumed, that, in the north of Europe, the water rat may be found white, as well as in Canada.

THE SCHERMAN OR STRASBURG WATER-RAT*.

I have here figured a species of water-rat which was sent me from Strasburg by M. Hermann, the 8th of October, 1776. "This little animal," he writes me, "has escaped our researches, and I have myself taken it for the common water-rat; however, it differs in some characters. It is smaller; the tail, hair, and ears, are different from the same in the water-rat; it is known about Strasburg by the name of scherman. The species is common enough in the gardens and meadows near the water. This animal swims and dives very well. It is often caught in the fishing nets, and it makes great havoc among the

* CHARACTER SPECIFICUS.

MUS SCHERMAN. M. cauda mediocri subpilosa, corpore supra fusco, subtus cinereo, pedibus parvis, auriculis vellere brevioribus.—*Shaw's Gen. Zool.* ii. p. 75.

LE SCHERMAN OU RAT D'EAU DE STRASBURG.—*Buff. Hist. Nat. par Sonn.* xxv. p. 219, pl. 7, fig. 3.

SCHERMAN RAT.—*Penn. Hist. Quadr.* ii. p. 182.

HABITAT

prope Strasburg. *W.*

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Plate 119

Warner Sc

SCHERMAN RAT.

cultivated grounds. It burrows; and there are some years in which, in one of the public walks on the outside of the town, called *le Contade*, a hamster-catcher, has taken a great number in the same snares * ".

By these indications, and by the description we are about to give of this little animal, it appears certain to me that it is of a different species, although bordering on that of our water-rat; but that its natural habits are nearly the same. Finally, the specimen which M. Hermann had the goodness to send us for the cabinet, has been placed there, and is very well preserved. In effect, it does not resemble any of the rats we have figured, all of which have large ears; in this one, they are almost as short as in the mole, and are hid under the very long hair: several rats, also, have the tail covered with little scales, while, in this, it is covered with hair like the water-rat.

The length of the body, from the end of the nose to the origin of the tail, is six inches. The tail is two inches three lines long, but it appears as if the last vertebræ were wanting, in so much, that, in a natural state, it might measure two inches nine lines. Its general colour was blackish brown mixed with gray and tawny, because the hair, which is fifteen lines long, is of a black gray at the root, and tawny at the tip. The head is shorter, and the muzzle thicker than in the domestic rat, and in the shape of its head

* Extract of a letter from M. Hermann, dated Strasburg, October 8, 1776.

it approaches the water-rat. The eyes are small; the opening of the mouth is edged with short white hair: the whiskers, of which the longest hairs measure thirteen lines, are black: the under part of the belly ismousé-gray. The legs are short, and covered with short blackish hair, as well as the feet, which are very small: there are, as in many rats, four toes on the fore-feet and five behind; the nails are white, and rather crooked and grooved. The tail is covered with short brown and ash-coloured hairs, but not so plentifully as in the water-rat.

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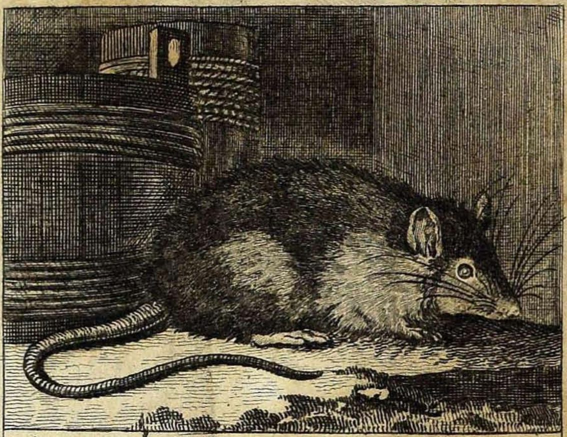
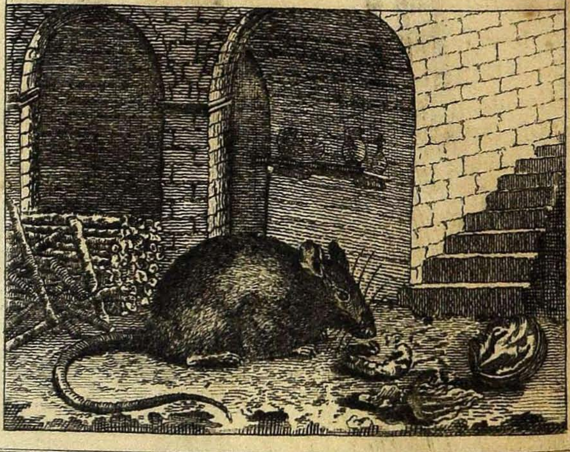


RAT.



MOUSE.

THE MOUSE*.

THE mouse is much smaller, equally numerous, and more generally diffused than the rat. It has the same instinct, the same constitution and natural dispositions, and differs only by its weakness, and the habits which result from

* CHARACTER SPECIFICUS.

Mus Musculus. M. cauda elongata subnuda, palmis tetradactylis, plantis pentadactylis: pollice mutico.—*Linn. Syst. Nat. Gmel.* i. p. 128.

Mus Domesticus Vulgaris.—*Ray's Quadr.* p. 219.

Mus Domesticus.—*Jonst. Quadr.* p. 165, pl. 66.

Mus Domesticus vel Communis.—*Gesn. Quadr.* p. 114.

La Souris.—*Buff. Hist. Nat. par Sonn.* xxv. p. 199, pl. 6, No. 3.

Common Mouse.—*Penn. Hist. Quadr.* ii. p. 184.—*Brit. Zool.* i. No. 30, pl. 11.—*Shaw's Gen. Zool.* ii. p. 56, pl. 131.

HABITAT

ubique in domibus et sylvis glandiferis. *W.*

An animal that needs no description; when found white, it is very beautiful, the full bright eye appearing to great advantage amidst the snowy fur.—*Penn. Synops. Quadr.* p. 302.

In Greek, Μυςκος; in Latin, *Mus, Musculus, Sorex*; in Italian, *Topo, Sorice, Sorgio di casa*; in Spanish, *Rat*; in German, *Musz*; in Swedish, *Mus*; in Polish, *Myss*; in French, *La Souris.*

this circumstance. Timid by nature, and familiar from necessity, fear and want are the sources of all his movements. He never issues from his hole but in quest of food, and runs in again upon the smallest alarm. He goes not, like the rat, from house to house, unless he be forced; and he is not near so destructive. His manners are gentle, and he may be tamed to a certain degree; but he never discovers the smallest attachment to his benefactors. It is not indeed easy to love those who are perpetually laying snares for us. Though weak, the mouse has many enemies, from whom he has no means of escape, but those of agility and minuteness. Owls, birds of prey, cats, weesels, and even rats, make war upon the mice. They are shot, caught in traps, and destroyed by millions. In a word, they subsist by their amazing fecundity alone.

They bring forth at all seasons, and several times in the year. The litter generally consists of five or six. In less than fifteen days the young are strong enough to disperse and to procure food for themselves. The duration of life in those small animals must, therefore, be short, since their growth is so rapid; and this circumstance still farther augments the idea of their prodigious multiplication. Aristotle tells us, that, having shut up a pregnant mouse in a vessel, along with plenty of grain, he, in a short time after, found 120 mice, all sprung from the same mother.

These little animals are by no means ugly;

they have a vivacious and elegant air. That species of horror which some people feel at them, arises from the surprise and inconveniences they sometimes occasion. All mice are whitish under the belly, and some are altogether white. Others are more or less brown and black. The species is generally diffused over Europe, Asia, and Africa; and, it is alleged, that those of America, where they are very numerous, came originally from the Old Continent. It is, however, certain, that this little animal follows man, and flies from uninhabited places, probably on account of its natural appetite for bread, cheese, butter, oil, and other aliments which men prepare for themselves *.

White mice, with red eyes, are found not only in our temperate climates, but in the southern and northern regions of both continents. "White mice, with red eyes," says Pontoppidan, "have been found in the small village of Ramsdallem; but, whether they are indigenous, or brought from the East Indies, is uncertain." This last supposition seems to have no foundation; for it is natural to expect white mice in Norway, as well as every where else in Europe; and mice, in general, are equally numerous in America as in the Old Continent.

* Pennant recommends the root of white hellebore and Stave's acre, powdered and mixed with meal, as a certain poison to them. *W.*

THE LONG-TAILED FIELD-MOUSE *.

THIS animal is less than the rat, and larger than the mouse. It never lives in houses, but is found in the fields and woods. Its eyes are

* CHARACTER SPECIFICUS.

MUS SILVATICUS. M. cauda longa squamosa, corpore griseo lutescente subtus lateribusque abrupte albo. — *Linn. Syst. Nat. Gmel.* i. p. 129. — *Shreber,* iv. p. 651, pl. 180.

Mus (silvaticus) cauda mediocri, corpore cano pilis nigris, pectore flavescente, abdomine albido. — *Erxleb. Mamm.* p. 388.

Mus cauda longa, supra e fusco flavescens, infra ex albo cinerascens. — *Briss. Quadr.* p. 174, No. 9.

MUS AGRESTIS MINOR. — *Gesn. Quadr.* p. 733.

MUS DOMESTICUS MEDIUS. — *Ray's Quadr.* p. 218.

LE MULOT. — *Buff. Hist. Nat. par Sonn.* XXV. p. 204, pl. 7, fig. 1.

WOOD-MOUSE. — *Shaw's Gen. Zool.* ii. p. 58, pl. 132.

FIELD-MOUSE. — *Penn. Hist. Quadr.* ii. p. 184. — *Brit. Zool.* i. No. 28.

HABITAT

in Europæ campis, silvis et hortis, siccioribus. Est quoque ad fretum Hudsonis. *W.*

This animal has full black eyes; its head, back, and sides, are of a yellowish brown, mixed with some dusky hairs; the breast is of an ochre colour, and the belly is white: its length, from the tip of the nose to the tail, is four inches and a half; and that of the tail, which is slightly covered with hair, is four inches. — *Penn. Synops. Quadr.* p. 302.

remarkably large and prominent; and it differs still more from the rat and mouse, by the colour of its hair, which is whitish under the belly and of a reddish brown on the back. It is very generally and copiously diffused, especially in elevated countries. It seems to take a considerable time in arriving at full growth, because it varies greatly in size. The largest are between four and five inches long; and the smaller ones, which appear likewise to be adults, are an inch shorter. And, as we find them of all intermediate sizes, both the great and small are unquestionably the same species. Ignorance of this fact has, probably, led some naturalists to make two species of them, the one called *the great field-rat*, and the other *the field-mouse*. Ray, who first fell into this blunder, seems to acknowledge that he knew but one species *. And though the short descriptions he has given of each species appear to differ, we ought not to conclude that both exist: 1. Because he himself knew but one. 2. Because, after all the researches I have made, I have not been able to discover more than one kind; because Gesner, and other naturalists, mention one species only, under the name of *mus agrestis major*, which, they say, is very common; and because Ray says that the other kind, called *mus domesticus medius*, is also very common: hence, it is apparent, that none of these authors have ever seen both kinds, since they ac-

* De hac specie mihi non undequaque satisfactum est.—*Ray's Quadr.* p. 219.

knowledge both to be very common. 3. Because in this single species, individuals are found of a larger and lesser size, this circumstance might lead them to consider the small as of one species, and the larger of another. Lastly, because the descriptions are too vague and inaccurate to establish a specific difference.

The ancients, indeed, mention two species, the one under the denomination of *mus agrestis major*, the other under that of *mus agrestis minor*. These two species are very common, and we know them as well as the ancients; the first is our long-tailed field-mouse: the second is not the *mus domesticus medius* of Ray, but another animal, known by the name of the *short-tailed field-mouse* or *little field-rat*. And, as it differs both from the rat and the long-tailed field-mouse, I have given it its Italian name, *compagnoli* or *compagnol*.

The long-tailed field-mouse, as I formerly remarked, lives in dry and elevated grounds. In the woods and adjacent fields, they are found in vast numbers. They retire into holes among the brushwood, and under the trunks of trees, where they amass great quantities of acorns, nuts, and beech-mast; sometimes a whole bushel is found in a single hole; and this hoard is not proportioned to the wants of the animal, but to the capacity of the place where it is deposited. These holes are generally more than a foot under ground, and often divided into two apartments, the one for living in along with their young, and the other for a magazine. I have frequently seen great

damage done to the plantations by these animals. They carry off the new sown acorns; by following the furrow of the plough, they dig up one after another, not leaving a single seed. This happens chiefly in those seasons when the acorns are scarce: not finding enough in the woods, they come in quest of them in the cultivated fields, and do not eat them on the spot, but transport them to their holes, where they amass such quantities, that they often corrupt. These creatures alone do more mischief in a nursery of trees than all the birds and other animals put together. The only way to prevent this damage is, to lay traps at ten paces asunder through the extent of the sown ground. No other apparatus is necessary than a roasted walnut placed under a flat stone, supported by a stick. The animals come to eat the walnut, which they prefer to acorns; and, as the walnut is fixed to the stick, whenever they touch it, the stone falls and crushes them to death. I have used the same expedient for the destruction of the short-tailed field-mouse, which likewise destroys acorns. When I began this operation, I desired all the mice that were caught by the traps to be brought to me, and found, with astonishment, that above one hundred were taken each day, from a piece of ground consisting only of about forty French arpents. From the 15th of November to the 8th of December, above two thousand were slain in this manner. Their numbers gradually decreased till the frost became severe, when they retire to their holes, and feed upon the magazines they have collected. It is

more than twenty years since I made this trial, which I always repeated when I sowed tree-seeds, and never failed to catch vast quantities of these mice. They abound chiefly in autumn; their numbers being much less in the spring: for, if provisions fail during the winter, the strong devour the weak. The long-tailed field-mice likewise eat the short-tailed species, and even thrushes, blackbirds, and other birds which they find entangled in snares. They first eat the brain, and then the rest of the body. I once kept a dozen of these mice in a cage, and furnished them with food every morning at eight o'clock. One day they were neglected for about a quarter of an hour, when one of their number was eaten up by the rest; next day another suffered the same fate; and, in a few days, one only remained: all the others had been killed, and partly devoured; and even the survivor himself had his feet and tail mutilated.

The rat is very prolific *; but the long-tailed field-mouse is more so. The latter brings forth more than once a year, and the litters often consist of nine or ten, while those of the rat never exceed five or six. In one hole I have found two

* Muschenbroek tells us, that such a prodigious number of these animals made their appearance in Holland, in the year 1742, that a countryman killed five or six thousand. Their ravages were known to the ancients; a temple being raised to Apollo *Smintheus*, in Phrygia, a sirname given to this god on account of his having delivered the inhabitants from a vast number of mice or rats.

W.

mothers and twenty young. This animal is very generally diffused over Europe. It is found in Sweden, and is called by Linnæus * *mus cauda longa, corpore nigro flavescente, abdomine albo.* It is very common in France, Italy, and Switzerland: Gesner calls it *mus agrestis major* †. The species is also numerous in Germany and in Britain, where it is called the *field-mouse.* It has for enemies, wolves, foxes, weesels, birds of prey, and its own species.

* Faun. Suec. p. 11.

† Gesn. Quadr. p. 733; Icon. Quadr. p. 116.

THE SHORT-TAILED FIELD-MOUSE*.

THE short-tailed field-mouse is still more common and more generally diffused than the long-tailed kind. The latter never appears in high

* CHARACTER SPECIFICUS.

MUS ARVALIS. M. cauda unciali, auriculis vellere prominulis, palmis subtetradactylis, corpore fusco. — *Linn. Syst. Nat. Gmel.* i. p. 134. — *Pall. Glir.* p. 79, No. 14. — *Schreb.* iv. p. 680, pl. 191.

MUS TERRESTRIS. M. cauda mediocri, auriculis vellere brevioribus, corpore supra ferrugineo, subtus cinereo. — *Erxleb. Mamm.* p. 395.

MUS CAMPESTRIS MINOR. M. cauda brevi, pilis e nigricante et sordide luteo mixtis in dorso, et saturate cinereis in ventre vestitus. — *Briss. Quadr.* p. 176.

MUS COMPAIGNOLO. — *Gesn. Quadr.* p. 733.

LE CAMPAGNOL. — *Buff. Hist. Nat. par Sonn.* XXV. p. 222, pl. 8.

MEADOW MOUSE. — *Penn. Hist. Quadr.* ii. p. 205. — *Shaw's Gen. Zool.* ii. p. 81, pl. 136.

SHORT-TAILED FIELD-MOUSE. — *Penn. Brit. Zool.* i. No. 31. — *Bew. Quadr.* p. 389.

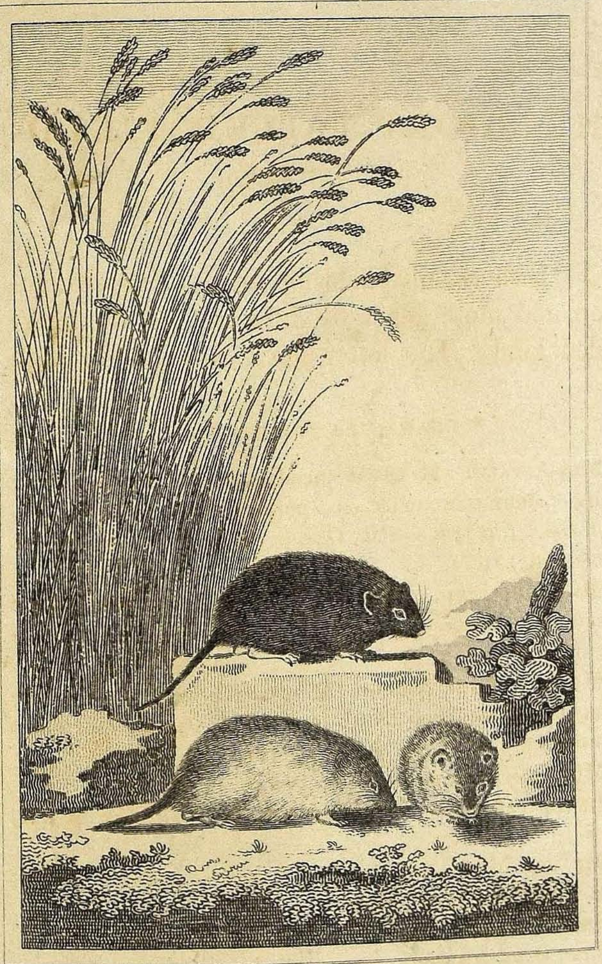
HABITAT

æstate in Europæ campis et hotis, hieme in silvis: reperitur quoque in America boreali. Subterraneum animal.

W.

330A

Plate 121



Audinet sculp

SHORT TAIL'D FIELD MOUSE.

grounds; but the former is found every where, in the woods, the fields, the meadows, and even in the gardens. It is remarkable for the thickness of its head, and the shortness of its tail, which exceeds not an inch in length. It digs holes in the earth, where it amasses grain, filberts, and acorns: but it appears to prefer corn to every other food. In the month of July, when the grain is ripe, the short-tailed field-mice assemble from all quarters, and often do great damage by cutting the stalks of the corn, in order to come at the ears. They follow the reapers, and eat up all the fallen or neglected grain. When the gleanings are devoured, they flock to the new-sown fields, and prematurely destroy the crop of the ensuing year. In winter, most of them retire into the woods, where they feed upon filberts, acorns, and the seeds of trees. In particular years, they appear in numbers so immense, that they would destroy every thing, if they continued long: but they always kill and eat one another during a scarcity of provisions. They, besides, become the prey of the long-tailed field-mouse, the fox, the wild cat, and the weesels.

In its internal structure, this animal resembles the water-rat more than any other; but differs

This animal has a large head, a blunt nose, short ears, hid in the fur, prominent eyes, and a short tail: the colour of the head and upper part of the body is ferruginous, mixed with black, and the belly is of a deep ash-colour. The length of the body, from tail to nose, six inches; and that of the tail, which is thinly covered with hair, and terminated by a small tuft, one inch and a half. — *Penn. Synops. Quadr.* p. 305.

from him externally by several essential characters: 1. By the size: the short-tailed field-mouse is not above three inches long; but the water-rat is seven inches. 2. By the dimensions of the head and body, those of the former being proportionally thicker than those of the latter. 3. By the length of the tail, which, in this field-mouse, exceeds not a third of the length of the animal's body; but the length of the tail of the water-rat is near two thirds of its body. Lastly, By its manners and dispositions: it feeds not upon fishes, nor goes into water, but nourishes itself with acorns, grain, and tuberous roots, such as those of the dandelion, &c. Their holes resemble those of the long-tailed field-mouse, and are often divided into two apartments; but they are neither so spacious nor so deep. Several of them frequently live together. When the females are about to bring forth, they make beds of herbs for their young. They produce in spring and summer, and the litter generally consists of five or six, and sometimes of seven or eight.

372 A

Plate 122

GUINEY PIG.

THE GUINEA-PIG*.

THIS little animal, though a native of Brasil and of Guinea †, lives and propagates in the

* CHARACTER SPECIFICUS.

Cavia Cobaya. C. ecaudata ex albo et rufo vel nigro variegata. — *Linn. Syst. Nat. Gmel.* i. p. 122. — *Schreb.* iv. p. 617, pl. 173.

Cuniculus Indicus. C. ecaudatus auritus albus aut rufus aut ex utroque variegatus. — *Briss. Quadr.* p. 147.

Cavia Porcellus. C. ecaudata, corpore variegato. — *Erxleb. Mamm.* p. 349.

Mus seu cuniculus Americanus et Guineensis. — *Ray's Quadr.* p. 223.

Cuniculus porcellus Indicus. — *Jonst. Quadr.* p. 162, pl. 63, 65, fig. mala.

Le Cochon d'Inde. — *Buff. Hist. Nat. par Sonn.* xxv. p. 220, pl. 8.

Guinea-Pig. — *Edwards, Av.* pl. 294, fig. 2.

Restless Cavy. — *Penn. Hist. Quadr.* ii. p. 89.

Variegated Cavy. — *Shaw's Gen. Zool.* ii. p. 17, pl. 126.

HABITAT

in Brasilia, non vero in Guinea; domestica colitur in Europa. *W.*

The *restless cavy* has two cutting teeth in each jaw; gene-

† This species was not originally a native of Guinea, but was brought there from Brasil. *W.*

temperate, and even in the cold climates, when protected from the inclemency of the seasons. Though Guinea-pigs multiply prodigiously in France, their numbers are never great; because the care they require is not compensated by the profits arising from them. Their skin is hardly of any value, and their flesh, though eatable, is not so good as to be much demanded; but it might be improved, by keeping them in warrens, where they would have the benefit of fresh air, and the liberty of choosing herbs agreeable to their taste. Those kept in houses have nearly the same bad taste with warren-rabbits; and those kept in gardens during summer have an insipid, but less disagreeable savour.

The temperament of these animals is so hot and premature, that they copulate five or six weeks after their birth. They acquire not, however, their full growth, before the eighth or ninth month. But this increase of size consists only of fat; for the solid parts are fully unfolded before the age of six months. The females go with young only three weeks; and I have known them bring forth at the age of two months. The first litter consists of four or five; the second of

rally four toes on the fore-feet, and three behind, short ears, and no tail, or a very short one: the upper lip is half divided; the ears are very large, broad, and rounded at the sides: the hair is erect, and not unlike that of a young pig: the colour is white, or white variegated with orange and black, in irregular blotches. — *Penn. Synops. Quadr.* p. 243.

In Brasil, it is called *Cavia Cobaya*; in German, *Indianisch Künele, Indisch Seüle, Meer-ferchel, Meer-schwein*; in Swedish, *Merswyn*; in Polish, *Swinka Zamorska.*

five or six; and the succeeding ones of seven or eight, and sometimes of ten or twelve. The mother suckles her young twelve or fifteen days; she banishes them as soon as she receives the male, which happens, at farthest, three weeks after her delivery; and, if any of them persist in following her, they are maltreated and slain by the father. Thus these animals produce at least every two months; and, as their young bring forth in the same space, we are astonished at their rapid and numerous multiplication. From a single couple, we may have 1,000 in one year. But their destruction is as rapid as their propagation. They are killed by cold and by moisture; they allow themselves, without resistance, to be eaten by the cats; even the mothers defend not their young from their destroyers; not having time to form an attachment to their young, they make no efforts to save them. The males are still less solicitous about their offspring, and even allow themselves to be devoured without resistance. They seem to have no distinct sentiment, but that of love. When under the influence of this passion, they are susceptible of anger, fight cruelly, and even kill each other in disputing the possession of a female. They pass their lives in sleeping, eating, and amours. Their sleep is short, but frequent; they eat every hour, both day and night, and they indulge in mutual embraces as often as they eat. Though perpetually throwing out urine, they never drink. They feed on all kinds of herbs, but especially on parsley, which they prefer to grain or to bread. They

are likewise fond of apples and other fruits. They eat precipitantly, like the rabbit, little at a time, but very often. They make a kind of grunting noise, similar to that of a young pig. A kind of chirping noise marks the time of their amours, and they raise a sharp cry when they feel pain. They are extremely delicate, and so impatient of cold, that it is difficult to preserve them through the winter. They must be kept in a dry, warm, wholesome place. When they feel cold, they assemble and crowd close together; and they often all perish in this situation. By nature, they are gentle and tame. They do no mischief; but they are equally incapable of good; for they never form any attachments. Mild by constitution, docile through weakness, almost insensible to every object, they have the appearance of living machines constructed for the purposes of propagation, and of representing a species*.

* It is said, that neither rats nor mice make their appearance in places frequented by Guinea-pigs: either their smell offends these little animals, or (as is more generally credited) the Guinea-pigs drive them away.

W.

336A

Plate 123

HEDGE HOG.

THE HEDGE-HOG*.

ΠΟΛΛ' οἶδ' αλωπηξ αλλ' εχῖνος εν μεγα: "That the fox knows many things, and the hedge-hog but one important thing," is a pro-

* ERINACEUS.

CHARACTER GENERICUS.

Dentes primores superiores duo, distantes; inferiores duo, approximati.

Laniarii superiores utrinque quinque, inferiores utrinque tres.

Molares utrinque supra et infra quatuor.

Dorsum spinis tectum.

CHARACTER SPECIFICUS.

Erinaceus Europæus. E. auriculis rotundatis, naribus cristatis.—*Linn. Syst. Nat. Gmel.* i. p. 115.—*Schreb.* iii. p. 580, pl. 162.—*Erxleb. Mamm.* p. 169.

Erinaceus auriculis erectis.—*Briss. Quadr.* p. 128.

Erinaceus Terrestris.—*Gesn. Quadr.* p. 368.—*Aldrov.* p. 459.—*Jonst. Quadr.* p. 171, pl. 68.—*Ray's Quadr.* p. 231.

Le Herisson.—*Buff. Hist. Nat. par Sonn.* xxv. p. 232, pl. 9.

Common Hedge-hog.—*Penn. Hist. Quadr.* ii. p. 234.

Common Urchin.—*Penn. Brit. Zool.* i. No. 35.

European Hedge-hog.—*Shaw's Gen. Zool.* i. p. 542, pl. 121.

HABITAT

in Europa, Sibiria, Ægypto, Madagascar. Rarior in Suecia;

verbial saying of the ancients*. The hedge-hog knows how to defend himself without fighting, and to wound without making an attack. Having little strength, and less agility for flight, he has received from Nature a spinous armour, with the faculty of rolling himself up like a ball, and of presenting on all sides those sharp weapons, which repel the enemy. The more he is harrassed, he rolls himself up the closer. His fears tend still farther to defend him; for, by throwing out his urine, the smell and humidity of which spread over his whole body, he completely disgusts the enemy. Thus most dogs content themselves with barking, and never choose to seize the hedge-hog. The fox, however, accomplishes his end by wounding the animal's feet, and making

in Norlandia vix occurrit. Domesticus cati loco ad Tanain. *W.*

This animal has five toes on each foot; and its body is covered with short spines. Its nose is long; the nostrils are bordered on each side with a loose flap; the ears rounded, broad, and naked; the eyes small; the legs short, naked, and dusky; the inner toe is shortest, and the claws are weak; the upper part of the face, the sides, and rump, are covered with strong coarse hair, of a yellowish and cinereous colour; the back with strong short spines of a whitish colour, with a bar of black through their middle: the tail is an inch long; and the length of the body, from nose to tail, is ten inches. —*Penn. Synops. Quadr.* p. 316.

In Greek, *εχινος*; in Latin, *Echinus, Herinaceus, Erinaceus, Echinus terrestris*; in Italian, *Erinaceo, Riccio, Aizzo*; in Spanish, *Erizo*; in Portuguese, *Ourizo, Orica cachero*; in German, *Igel*; in Swedish, *Igelkott*; in Danish, *Pind Svin*; in Polish, *Jez, Ziennay*; in Dutch, *Yseren Vercken*; in French, *Le Herisson, Eurchon.*

* Zenodotus, Plutarchus, et alii ex Archilocho.

the blood run into its mouth. But the hedge-hog is proof against the weesel, the martin, the polecat, the ferret, and birds of prey. From the head to the tail, both male and female are equally covered with spines, and the under parts of their bodies only are garnished with hair. But those arms, which are so useful to them in defending against enemies, become exceedingly inconvenient when they want to unite. They cannot copulate in the manner of other quadrupeds, but face to face, either on end or lying. The females come in season in the spring, and bring forth in the beginning of summer. I have frequently had the mother and her young brought to me in the month of June. The litter generally consists of three or four, and sometimes of five. When very young, they are white, and the buds of the spines are only visible through the skin. I tried to rear some of them, by putting the mother and her young in a barrel, with plenty of provisions: but, instead of suckling, she devoured them one after another *. This was not the effect of hunger; for she eat bread, meat, and fruits. One

* The hedge-hog is far from having a malevolent character; on the contrary, he is justly described, by Pennant, as a mild, helpless, and patient animal, that would be liable to injury from every enemy, had not Providence guarded him with a strong covering, and a power of rolling himself into a ball, by that means securing the defenceless parts. — The patience of this inoffensive animal has been most cruelly proved by anatomists; one that was dissected alive, and whose feet were nailed down to the table, endured the torment without making the least noise. "Clavis terebrari sibi pedes et discindi viscera patientissime ferebat; omnes cultri ictus sine gemitu

would never have imagined, that an animal so slow and indolent, could be so impatient of confinement. It even possesses the same species of malevolence with that of the monkey. A hedge-hog, that had slipped into the kitchen, took the meat out of a small kettle, and defiled it with his ordure. I kept males and females in a room together; but, though they lived, they never coupled. I left several of them in my gardens, where they did so little mischief, that it could hardly be perceived. They live upon fallen fruits; and dig the earth to a small depth with their noses. They eat May-bugs, beetles, grass-hoppers, worms, and some roots. They are likewise fond of flesh-meat, which they devour either raw or roasted. In the country, they are frequently found in the woods, under the trunks of old trees, in the clefts of rocks, and particularly among the stones collected upon the fields and vineyards. I am uncertain whether they climb trees, as some naturalists assert *, or use their spines for transporting fruits or grapes. They seize with the mouth every thing they eat; and, though they abound in our forests, they have never been discovered upon trees, but are always found in holes or under the moss. They stir not during the day, but go about the whole night. They approach not the habitations of

plusquam Spartana nobilitate concoquens." — *Borrich. in Blas; de Echino.* p. 64. *W.*

* Arbores ascendit, poma et pyra decutit, in istis sese volutat ut spinis hæreant. — *Sperling, Zoologia,* p. 281.

men; but, though they sometimes appear in the meadows, they prefer dry and elevated grounds. They are taken by the hand, never fly, nor defend themselves with their feet or their teeth; but, when touched, they roll up in the form of a ball, and will not extend themselves, unless they be plunged in water. They sleep during the winter; and, therefore, the provisions they are said to amass in summer, would be entirely useless to them. They eat little, and can live long without food. Their blood is as cold as that of those other animals who sleep during winter. Their flesh is not good eating; and their skin, of which no use is now made, was formerly employed for heckling hemp.

The following are some observations that I made on hedge-hogs which I brought up tame.

The 4th of June, 1781, four young hedge-hogs were brought me with their mother; their points, or spines, were perfectly formed, which seemed to indicate that they were several weeks old. I put them together into a large wired cage, to observe them conveniently, and spread the bottom with branches and leaves, to procure these animals a little retreat to sleep in.

During the two first days, I gave them only pieces of beef bouilli, which they did not eat; but merely sucked all the juicy part without eating the fibres of the flesh. The third day we gave them several sorts of herbs, such as groundsel, bind-weed, &c., but they did not eat it; therefore we may say that they almost fasted during these three days; however, the mother

did not seem weak, and often suckled her young ones.

The following days they had cherries, bread, and raw bullocks' liver; they sucked this last meat eagerly, and the mother and little ones remained at it till they appeared satiated: they also ate a little bread, but they did not touch the cherries. They showed a great inclination for raw chickens' guts, as well as for peas and dressed greens: but eat what they may, it is not possible to find their excrement, and it is presumed that they eat it, like some other animals.

It appears that they can do without water, or at least that drink is not more necessary for them than for rabbits, hares, &c. They had nothing to drink during the whole time we preserved them, and yet they were always very fat and well looking.

When the young ones want the breast, the mother lies down on her side, that they may suck more at their ease: these animals have such short legs, that the young would hardly get under the belly of the mother if she stood on her feet. They sleep at the breast, without being awaked by the mother; she even seems afraid to move, lest she should disturb their repose. Willing to observe if this kind of attention in the mother for her young, was the effect of her attachment for them, or if she herself was not interested in remaining at rest, we soon perceived, that, whatever love she might have for them, she had more for her liberty. We opened the cage while the little ones were asleep; as soon as she perceived

it, she rose gently, went into the garden, and removed as fast as she could from her cage, to which she did not return of her own accord, but was obliged to be carried. We often remarked, that, when she was shut up with her young, she commonly employed all the time while they slept in ranging round the cage, and trying, according to all appearance, to find a proper outlet to escape through, and she never discontinued these unquiet movements, except when the young were awake. From whence it was easy to judge, that this mother would willingly quit her little family; and that, if she seemed fearful to wake them, it was only to rid herself of their importunities; for the young hedge-hogs were so greedy of the breast, that they often remained attached for several hours together. It is perhaps this voracious appetite in the young hedge-hogs, that causes the mothers, tired out, or exhausted by their greediness, sometimes unnaturally to destroy them.

As soon as the hedge-hogs hear a footstep, or see any one near them, they crouch on the ground, and draw in their head on the breast; so that they present the spines which are on the top of the forehead, and which are the first to be erected; they afterwards draw in their hind-feet forwards, and thus force them to approach the extremities of their body, or rather to squeeze them against each other, which gives them the shape of a pincushion, or of a ball, bristled with spines at all points. This pincushion is not

quite round, it is alway thinner where the head joins to the back part of the body. The more suddenly they take this round form, the stronger they compress the two extremities of their body. The contraction of their muscles appears then to be so violent, that, when they are at any time rolled up as much as possible, it would be almost as easy to dislocate their limbs, as to stretch them out at full length. We have often tried to stretch them, but they seemed to resist in proportion to our efforts, and in an instant rolled themselves into a ball. We remarked that they made a slight noise, a sort of clacking, which was occasioned by the friction of the points, which cross each other in all possible directions. It is then that the body of these animals appears studded with a vast many points, and that they are truly on the defensive. When nothing disturbs them, the same points or spines, so erect when they would defend themselves, are laid down backwards one upon the other, like the smooth hair of other animals: however, this is only when the hedge-hogs, being awake, enjoy calmness and tranquillity; for when they sleep, their arms are ready, that is to say, their points cross each other in all directions, as if they had to repel an attack. It seems, then, that during their sleep, which is very profound, Nature has taught them instinctively to guard against surprise.

Finally, these animals have not the means of attacking others; they are naturally indolent,

and even slothful: rest seems to be as necessary to their way of life as food; and, we may say with sufficient truth, that their unique and only operations are to eat and sleep. In effect, those which we reared, sought for food as soon as they awoke; and when they had eaten enough, they retired to sleep again on their leaves. These are their habits in the day-time; but during the night, they are restless, and hunt for snails, great beetles, and other insects, which constitute their principal food.

Some authors mention two species of hedge-hog, one with a snout like a hog, and the other with a muzzle resembling that of a dog. But I know one species only, of which there are even no varieties in our climates. The hedge-hogs are very generally diffused; they are found every where in Europe, except in the cold regions of Norway, Lapland, &c. There are hedge-hogs, says Flacourt *, in Madagascar, and they are called *Sora*. The hedge-hog mentioned by Tachard † seems to be another animal; and the hedge-hogs of America ‡, and of Siberia §, are the species which approach nearest to that of the common kind. Lastly, the hedge-

* Voyage de Flacourt, p. 152.

† Le second Voyage du P. Tachard, p 272.

‡ Echinus Indicus albus.—*Ray, Synops. Quadr.* p. 232. Echinus Americanus albus.—*Albert Seba,* vol. i. p. 78. Acanthion echinatus, Erinaceus Americanus albus Surinamensis.—*Klein. Quadr.* p. 66.

§ Erinaceus Sibericus.—*Albert Seba,* vol. i. p. 66.

hog of Malacca* seems to come nearer the porcupine than the hedge-hog.

* Porcus aculeatus seu Histrix Malaccensis.—*Albert Seba*, vol. i. p. 81. Acanthion aculeus longissimis; Histrix genuina; Porcus aculeatus Malaccensis.—*Klein. Quadr.* p. 66. Histrix Malaccensis; auriculis pendulis.—*Linn. Syst.* p. 75. Erinaceus auriculis pendulis.—*Briss. Regn. Anim.* p. 183.

THE SHREW-MOUSE*.

THE shrew-mouse seems to form a link in the chain of small animals, and to fill the interval between the rat and the mole, which, though they

* SOREX.

CHARACTER GENERICUS.

Dentes primores superiores duo, longi, bifidi: inferiores duo vel quatuor; intermediis brevioribus.

Laniarii utrinque plures.

Molares cuspidati.

CHARACTER SPECIFICUS.

Sorex Araneus. S. cauda mediocri, corpore subtus albido. — *Linn. Syst. Nat. Gmel.* i. p. 114.—*Schreb.* iii. p. 573, pl. 160.—*Erxleb. Mamm.* p. 125.

Mus araneus, supra ex fusco rufus, infra albicans. — *Briss. Quadr.* p. 126.

Mus Araneus. — *Gesn. Quadr.* p. 747. — *Aldrov.* p. 441. — *Jonst. Quadr.* p. 168, pl. 66.—*Ray's Quadr.* p. 239.

La Muscaraigne.—*Buff. Hist. Nat. par Sonn.* xxv. p. 246, pl. 10.

Fetid Shrew. — *Penn. Hist. Quadr.* ii. p. 224. — *Brit. Zool.* i. No. 32.

Common Shrew.—*Shaw's Gen. Zool.* i. p. 527, pl. 118.

resemble each other in size, differ greatly in figure, and are very distant species. The shrew is still smaller than the mouse, and has an affinity to the mole, by its long nose; by its eyes, which, though larger than those of the mole, are much concealed and more minute than those of the mouse; by the number of its toes, having five on each foot; by the tail and legs, especially the hind-legs, which are shorter than those of the mouse; by the ears; and, lastly, by the teeth. This little animal has a strong and peculiar odour, which is very disagreeable to the cats, who pursue and kill, but never eat the shrews. It is probably this bad smell, and the reluctance of the cats, which have given rise to the vulgar prejudice, that the bite of the shrew-mouse is venom-

HABITAT

in Europæ silvis, ruderatis, cryptis subterraneis, prope fimeta: ex quoque in freto Hudsonis. *W.*

The shrew-mouse has two cutting teeth in each jaw, pointing forward, a long slender nose, small rounded ears, and five toes on each foot. The eyes are small and almost hid in the fur; the nose is long and slender, the upper part being longest; the head and upper part of the body are of a brownish red colour, and the belly of a dirty white. The length of the body, from nose to tail, two inches and a half, and that of the tail one inch and a half.—*Penn. Synop. Quadr.* p. 307.

In Greek, Μυγαλη; in Latin, *Mus araneus, Mus cæcus*; in Italian, *Toporagno*; in Spanish, *Marganho*; in German, *Muger, Spigmus, Zismus, Spitzmaus, Haselmaus*; in Swedish, *Nabbmus*; in Polish, *Keret*; in Silesia, *Bisem-mus*; among the Grisons, *Musarring*; in Swiss, *Mütrer*; in Savoy, *Muset, Musette*; in French, *La Musaraigne, Muserain, Muzeraigne, Muset, Musetre, Sery, Sri.*

ous, and particularly hurtful to horses. But the shrew is neither venomous, nor is it capable of biting; for the aperture of its mouth is not large enough to take in a duplicature of another animal's skin, which is absolutely necessary to the action of biting. The disease of horses, vulgarly ascribed to the bite of the shrew-mouse, is a swelling or blotch, and proceeds from an internal cause, which has no relation to a bite. This animal, especially in winter, frequents hay-lofts, stables, barns, and dunghills. It feeds upon grain, insects, and putrid flesh. In the country, it frequents the woods, and lives upon grain. It conceals itself under moss and the leaves and trunks of trees, and sometimes in the holes abandoned by the mole, or in smaller holes which it digs with its muzzle and claws. The shrew produces an equal number of young, though not so frequently as the mouse. Its cry is also much sharper; but it is not nearly so agile. It is easily taken; because it both sees and runs badly. The colour of the shrew is a mixture of brown and red; but some are ash-coloured, and others nearly black, though all of them are white under the belly. They are very common in Europe; but they seem not to exist in America. The Brasilian animal mentioned by Marcgrave *, under the name of the shrew-mouse, which, he says, has two black lists on the back, is larger, and seems to be a different species.

* Marcgravii Hist. Brasil, p. 220.

THE WATER-SHREW, OR BLIND MOUSE*.

THE water-shrew, though a native of this climate, was unknown to any naturalist till

* CHARACTER SPECIFICUS.

Sorex Fodiens. S. cauda mediocri subnuda, corpore nigricante subtus cinereo, digitis ciliatis.—*Linn. Syst. Nat. Gmel.* i. p. 113.—*Schreb.* iii. p. 571, pl. 161.

Sorex Daubentonii. — *Erxleb. Mamm.* p. 124.

Mus araneus, dorso nigro ventreque albo. — *Merret, Pin.* p. 167.

La Muscaraigne d'Eau.—*Buff. Hist. Nat. par Sonn.* xxv. p. 252, pl. 10. fig. 2.

Water-Shrew. — *Penn. Hist. Quadr.* ii. p. 225. — *Brit. Zool.* i. No. 33, pl. 11. — *Shaw's Gen. Zool.* i. p. 534, pl. 118.

HABITAT

in Anglia, Burgundia, Germania, Siberia ad fontes et rivos, mane et vesperi; interdiu latet in fissuris rupium et intra terram.

Daubenton found a great quantity of worms in the gall-bladder of a water-shrew, that resembled the fluke-worm which is occasionally seen in the livers of sheep, and in several other animals. *W.*

This animal has a long slender nose, very minute ears, and very small eyes, hid in the fur: the colour of the head and

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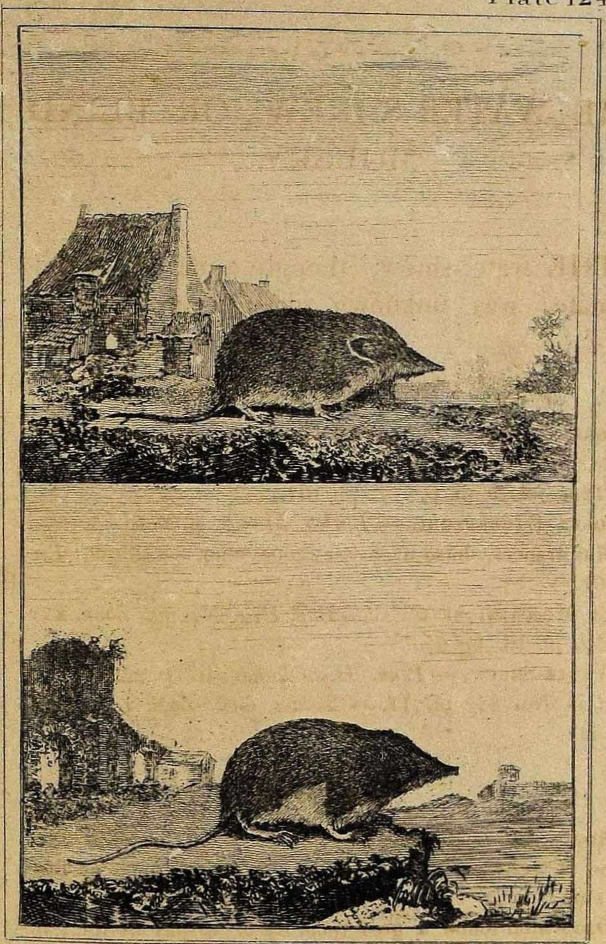
SHREW MOUSE.

Plate 124



WATER SHREW MOUSE.

M. Daubenton * discovered and gave an exact description of it †. This animal is taken near the sources of fountains, at the rising and setting of the sun. During the day, it lies concealed in clefts of rocks, or in holes upon the banks of rivulets. It brings forth in the spring, and the litter generally consists of nine.

upper part of the body is black; and of the throat, breast, and belly, a light ash-colour: beneath the tail is a triangular spot. It is much larger than the common shrew; being, from nose to tail, three inches and three quarters long; and the length of the tail is two inches.—*Penn. Synop. Quadr.* p. 308.

* Mem. de l'Acad. ann. 1756. Mem. sur. les Musaraignes, par M. Daubenton.

† This assertion seems not to correspond with the following remark in p. 308, of Pennant's Synopsis: "The water-shrew mouse was long since known in England, but lost till May, 1768, when it was discovered in the fens near Revesly Abbey, Lincolnshire: it burrows in the banks, near the water, and is called by the fen-men, *the blind mouse*."

THE BRASILIAN SHREW*.

WE mention this animal under the denomination of the *Brasilian shrew*; because we are ignorant of its proper name, and it has a greater resemblance to the shrew than to any other animal. It is, however, considerably larger, being about five inches long from the extremity of the muzzle to the origin of the tail, which is not two inches, and, consequently, is proportionally shorter than that of the common shrew.

* CHARACTER SPECIFICUS.

SOREX BRASILIENSIS. S. fuscus, dorso striis tribus nigris.—*Linn. Syst. Nat. Gmel.* i. p. 115.—*Erxleb. Mamm.* p. 127.

Mus Araneus figura muris.—*Marcgr. Brasil*, p. 229.

LA MUSARAIGNE DU BRASIL.—*Buff. Hist. Nat. par Sonn.* xxv. p. 254.

BRASILIAN SHREW.—*Penn. Hist. Quadr.* ii. p. 223.—*Shaw's Gen. Zool.* i. p. 535.

HABITAT

in Brasilia. *W.*

Brasilian shrew, with a sharp nose and teeth; pendulous scrotum. It is of a dusky colour, marked along the back with three broad black strokes. The length from nose to tail five inches; that of the tail two.—*Penn. Hist. Quadr.* p. 309.

It has a pointed muzzle, and very sharp teeth. Upon a brown ground-colour, three pretty large black bands extend longitudinally from the head to the tail, under which the scrotum appears hanging between the hind-feet. This animal, says Marcgrave, sports with the cats, who discover no inclination to eat it. In the same manner, the cats kill the European shrews, but never eat them.

THE INDIAN MUSK SHREW*.

THIS shrew, brought from Pondicherry by M. Sonnerat, is much larger than our species, the length of whose body is not more than two inches eleven lines, while this measures five inches two lines. The head is long and pointed; the nose slender, and the upper jaw longer than the lower: the end of the nose is divided, and has the appearance of two little tubercles: the eyes are so small as scarcely to be perceived.

The ears are short, round, and naked. The whiskers are of a grayish colour, as well as the hair above the eyes; the longest measures seven lines.

The legs are small and short, and there are five toes on each foot. The tail is an inch and eight

* CHARACTER SPECIFICUS.

Sorex Cærulescens S. cinereo cærulescens, subtus pallidior, rostro cauda pedibusque carneis—*Shaw's Gen. Zool.* i. p. 533.

Sorex Pilorides.—*Museum, Lever.* vol. i. No. 1, p. 31, pl. 8.

La Musaraigne Musquee de l'Inde.—*Buff. Hist. Nat. par Sonn.* xxv. p. 256, pl. 10, fig. 3.

Perfuming Shrew.—*Penn. Quadr.* ii. p. 222.

HABITAT

in India. *W.*

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Plate 125

INDIAN MUSK SHREW.

lines long; it is covered with small short hairs, besides some long ones of a grayish colour which are scattered upon it.

The colour of this animal is mouse-gray or clear slate, tinted with reddish on the nose, the back, and the tail.

This shrew, which greatly resembles the European kind, has so strong a smell of musk, that it leaves its scent wherever it goes. It is an inhabitant of the fields, but it also frequents the houses.

THE TUCAN, OR MEXICAN SHREW*.

FERNANDES has given the name of *tucan* to a small quadruped of New Spain, whose size, figure, and natural habits, make it approach nearer to the mole than to any other species. It appears to be the same animal described by Seba under the denomination of the *red mole* of America †; at least, the descriptions of the two authors correspond sufficiently to justify this conjecture. The tucan is perhaps somewhat larger than our mole. It is equally fat and fleshy, and its legs are so short that the belly touches the ground. The tail is short; the ears are small and round; and the eyes are so minute that they can scarcely be of any use to the animal. But it differs from the mole in the colour of the hair, which is reddish yellow, and

* Mexican shrew, with a sharp nose; small round ears; without sight; two long fore teeth above and below; thick, fat, fleshy body, short legs, so that the belly almost touches the ground; long crooked claws; tawny hair; short tail; length, from nose to tail, nine inches. — *Penn. Synops. Quadr.* p. 310.

† Seba, vol. i. p. 51, tab. 32, fig. 2.

in the number of toes, having only three before and four behind, while the mole has five toes on all the feet. It seems to differ from the mole in other articles: its flesh is good eating. It possesses not the instinct of discovering its retreat after having once left it, but, at every time, is obliged to dig a new hole; so that, in certain soils, which are agreeable to these animals *, the holes are so numerous, and so near each other, that circumspection is necessary to walk there with safety.

* Fernand. Hist. Anim. Nov. Hisp. p. 9. cap. 24.

THE MOLE*.

THE mole, though not blind, has eyes so small, and so covered, that it can have little benefit from the sense of seeing. Nature, by way

* TALPA.

CHARACTER GENERICUS.

Dentes primores inæquales superiores sex; inferiores octo.
Laniarii unici, superiores majores.
Molares superiores septem, inferiores sex.

CHARACTER SPECIFICUS.

Talpa Europæa. T. cauda brevi, pedibus pentadactylis.—*Linn. Syst. Nat. Gmel.* i. p. 110.—*Erxleb. Mamm.* p. 114.

Talpa caudata nigricans, pedibus anticis et posticis pentadactylis.—*Briss. Quadr.* p. 204.

Talpa Europæa.—*Forster, Phil. Trans.* lvii. p. 342.

Talpa.—*Plin. Hist. Nat.* xi. c. 37.—*Gesn. Quadr.* p. 931.—*Aldrov.* p. 449.—

La Taupe.—*Buff. Hist. Nat. par Sonn.* xxv. p. 258, pl. 11.

European Mole.—*Penn. Hist. Quadr.* ii. p. 229.

Common Mole.—*Shaw's Gen. Zool.* i. p. 315, pl. 117.

HABITAT

in omnis Europæ, borealis quoque Asiæ et Africæ apricis hu-

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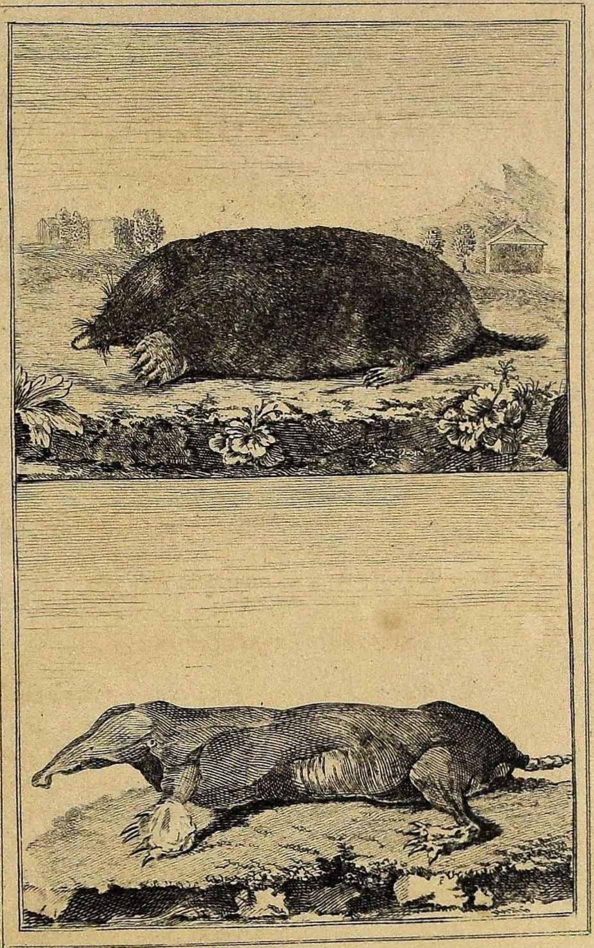
MOLE.

Plate 126



MOLE.
deprived of its skin.

of recompense, has bestowed on it a profuse portion of the sixth sense, remarkable vessels and reservoirs *, a prodigious quantity of seminal fluid, enormous testicles, a penis of immoderate length; and all these parts are concealed within the body, which must render them more hot and active. Of all animals the mole is most amply endowed with generative organs, and consequently with their relative sensations. It has, besides, a deli-

mosis cultis. Subterranea, antro cuniculi clauso. Terram fodit celerime palmis, plantis terram removet retrorsum.

In Hibernia nulla. *W.*

In Greek, Ασπαλαξ; in Latin, *Talpa*; in Italian, *Talpa*; in Spanish, *Topo*; in German, *Muhverf, Maulwurf*; in Swedish, *Mullvad*; in Polish, *Kret*; in French, *La Taupe*.

The mole has a long nose and snout; the upper jaw much longer than the under, no external ears, fore-feet very broad, with scarce any apparent legs before, and hind-feet very small. It has very minute eyes, hid in the fur, six cutting teeth in the upper, eight in the lower jaw, and two canine in each. The fore-part of the body is thick and muscular, and the hind-part taper; the fore-feet are placed obliquely, and resemble hands, with five toes, each terminated by strong claws. The hind-feet are very small, with five toes to each. The tail is short, and the skin very tough, so as scarce to be cut through. The hair, which is short, close set, and softer than the finest velvet, is usually black, sometimes spotted with white, and sometimes quite white. The length of the body is five and three fourth inches, and that of the tail one. — *Penn. Synops. Quadr.* p. 311.

* Testes maximos, parastatas amplissimas, novum corpus seminale ab his diversum ac separatum—penem etiam facile omnium, ni fallor animalium longissimum; ex quibus coligere est maximam præ reliquis omnibus animalibus voluptatem in coitu, hoc abjectum et vile animalculum percipere, ut habeant quod ipsi invidiant qui in hoc supremas vitæ suæ delicias collocant. — *Ray, Synops. Quadr.* p. 239.

cate sense of touch; a skin as soft as velvet; a very fine ear, and small hands, with five fingers, very different from the extremities of other quadrupeds, and nearly similar to the human hand; great strength in proportion to the size of its body; a compact skin; and a perpetual vigour. So lively and reciprocal an attachment subsists between the male and female, that they seem to dread or disrelish all other society. They enjoy the placid habits of repose and of solitude, the art of securing themselves from disquiet and injury, of instantaneously making an asylum or habitation, of extending its dimensions, and of finding a plentiful subsistence, without the necessity of going abroad. These are the manners, the dispositions, and the talents of the mole; and they are unquestionably preferable to talents more brilliant and more incompatible with happiness, than the most profound obscurity *.

The mole shuts up the entrance of her retreat, and seldom leaves it, unless compelled by the ad-

* The smallness of the eyes, says Pennant, is to this animal a peculiar happiness: a small degree of vision is sufficient for an animal ever destined to live under ground: had these organs been larger, they would have been perpetually liable to injuries, by the earth falling into them; but Nature, to prevent that inconvenience, hath not only made them very small, but also covered them very closely with fur. Anatomists mention (besides these) a third very wonderful contrivance for their security; and inform us, that each eye is furnished with a certain muscle, by which the animal has the power of withdrawing or exerting them, according to its exigencies. —*Brit. Zool.* i. p. 130, 8vo. ed.

W.

mission of water, or when its mansion is demolished by art. She makes a round vault in the meadows, and generally a long trench in the gardens; because it is easier to remove cultivated ground, than a turf rendered compact and solid by the roots of herbs. She continues not long in miry nor in hard stony ground, but delights in a soft earth, stored with esculent roots, and well peopled with insects and worms, which constitute her chief nourishment *.

As the moles seldom leave their subterranean abodes, they have few enemies, and easily elude the carnivorous animals. The overflowing of rivers is their greatest scourge: during inundations, they are seen swimming in vast numbers, and using every effort to gain the more elevated grounds; but most of them perish, as well as their young, who remain in their holes. Without this devastation, the great talents they have for multiplying would render them extremely incommodious to man †. They couple about the end of winter, and go but a short time with young; for we find them very small in the month of May. They generally bring forth four or five

* The mole shows great art in skinning a worm, which it always does before it eats it; stripping the skin from end to end, and squeezing out all the contents of the body.

W.

† Mortimer recommends the roots of palma christi and white hellebore made into a paste, and laid in their holes to destroy them; but the countryman generally depends upon his spring-traps.

W.

at a time; and it is easy to distinguish the hillocks under which they litter; for they are larger, and made with more art than the common kind. I believe these animals bring forth more than once a year; but of this I cannot be certain: it is a fact, however, that we meet with young ones from April to August. Perhaps some of them may be later in coupling than others.

The habitation where they deposit their young merits a particular description; because it is constructed with singular intelligence. They begin with raising the earth, and forming a pretty high arch. They leave partitions, or a kind of pillars at certain distances, beat and press the earth, interweave it with the roots of plants, and render it so hard and solid, that the water cannot penetrate the vault, on account of its convexity and firmness. They then elevate a little hillock below, upon the top of which they lay herbs and leaves, for a bed to their young. In this situation, they are above the level of the ground, and consequently out of the reach of ordinary inundations, and are, at the same time, defended from the rains by the large vault that covers the internal one, upon the convexity of which they rest, along with their young. This internal hillock, or vault, is pierced on all sides with sloping holes, which descend still lower, and serve as subterraneous passages for the mother to go in quest of food for herself and her offspring. These by-paths are firm and beaten, extend about twelve or fifteen paces, and issue from the mansion like rays from a centre. We likewise find,

under the superior vault, the remains of the roots of the *colchicum*, or meadow saffron, which seem to be the first food given to the young. From this description it is apparent, that the mole never comes out but at a considerable distance from her habitation, and that the most simple and most certain method of taking both the old and the young, is to make a round trench, which will cut off all the communicating passages. But, as the mole, upon the smallest noise, flies, and endeavours to carry off her young, it will be necessary to employ three or four men with spades to raise the hillock at once, or to make a trench almost instantaneously, and then to seize them, or to watch them as they attempt to escape.

It has been foolishly asserted by some writers *, that the mole and badger sleep during the whole winter, without taking any food. The badger, as we formerly remarked †, comes out of his hole in winter, as well as in summer, in quest of provisions; and it is easy to be ascertained of this fact, by the tracks he leaves upon the snow. The mole sleeps so little in winter, that she raises the earth in the same manner as she does in summer; and the country people remark, that *a thaw approaches, because the moles make hills*. They are, indeed, fond of warm places; and they are often caught by the gardeners in the months of December, January, and February.

* Ursus, *Meles*, Erinaceus, *Talpa*, Vespertilio per hyemem dormiunt abstemii. — *Linn. Faun. Suec.* p. 8.

† See the article Badger.

The mole frequents cultivated countries only. There are none in the dry deserts, nor in the cold climates, where the earth is frozen during the greatest part of the year. The animal called the Siberian mole *, with green and yellow hair, is a different species from our mole, which abounds only from Sweden † to Barbary ‡; for, from the silence of travellers, it is presumeable, that they exist not in hot climates. Those of America are likewise different: the Virginian mole §, however, has a great resemblance to ours, except in the colour of the hair, which is mixed with a deep purple. But the red mole of America is a different animal ‖. There are only two or three varieties in our common moles; we find them more or less brown or black; and we have seen them entirely white. Seba describes and gives a figure of a black and white mole, which was found in East-Friesland, and was somewhat larger than our mole ¶.

Pontoppidan assures us, that the mole exists not in Norway, because that country is too rocky to afford it proper accommodation.

* Albert Seba, vol. i. p. 5.

† Linn. Faun. Suec. p. 7.

‡ Shaw's Travels.

§ Albert Seba, vol. i. p. 5.

‖ Id. ibid.

¶ This mole was found on the highway. It is longer than the common mole, from which it differs in the colour of the skin only, which is variegated on the back and belly with black and white spots, together with a mixture of gray hair as fine as silk. The muzzle of this animal is long, and garnished with long bristly hair. The eyes are so small, that it is difficult to discover them.—*Albert Seba*, vol. i. p. 68.

I have hitherto mentioned only the common kind of European mole: it is now necessary to notice the principal varieties. I cannot therefore do better, than to give an extract from an excellent memoire on the mole, by M. de la Faille, printed in 1769; since it contains many new observations, and some facts which were unknown to me.

We may distinguish, according to M. de la Faille, five different European moles.

1°. Our garden mole with its soft black hair.

2°. The white mole, which only differs from the common in colour: it occurs most frequently in the northern countries, and is more abundant in Holland than in France.

3°. The tawny mole, which, he says, is seldom found except in Aunis; it is of a clear red, lighter on the belly, without any spot or mixture, it seems to form a shade in the species of white mole, only it is somewhat larger. M. de la Faille had seen but one, which was caught at Rochelle in the same place as the white kind.

4°. The greenish yellow, or citron mole, which is found in the territory of Alais, in Languedoc: it is of a fine citron colour, which it is said to owe to the earth which it inhabits: it is found between Aulas and the hamlet called *les Carrieres*, in Alais.

5°. The spotted or variegated mole, which is found in several of our European countries. Those of *Ost frise* are covered with black and white spots: in Switzerland, in England, and in the territory of Aunis, they have black hair variegated with tawny.

Independent of these five kinds of European mole, travellers speak of a Javan species, with the feet and half the legs, white. Those of Virginia, in America, have shining blackish hair mixed with deep purple. All these moles seem to be mere varieties of the common kind, since they differ only in colour; but there are others which appear to constitute distinct species, because they differ from the common mole, not only in colour, but also in the shape of their body and members *.

* The mole was sacred to Latona, on account, according to Antoninus Liberalis, of her having assumed the form of that animal to elude the pursuit of Typhon. Its very small eyes escaped the observation of the ancients, who deny it the sense of sight:

Aut oculis capti fodere cubilia talpæ.

VIRG. *Georg.* 1.

We learn from Plutarch, that the Egyptians (who considered darkness more ancient than light) paid divine honours to the mole on account of its supposed blindness.

W.

THE SIBERIAN, OR GILDED MOLE*.

IN Siberia, there is a mole called the *gilded mole*, whose species is probably different from the common kind; because it wants the tail, has

* CHARACTER SPECIFICUS.

TALPA ASIATICA. T. ecaudata, palmis tridactylis. — *Linn. Syst. Nat. Gmel.* i. p. 111.—*Erxleb. Mamm.* p. 120.

Talpa (Siberica aurea) ecaudata ex viridi aurea, pedibus anticis tridactylis, posticis tetradactylis. —*Briss. Quadr.* p. 206.

Talpa Sibericus versicolor, Aspalax dictus. — *Seb. Mus.* i. p. 51, pl. 32, fig. 4, 5.

LA TAUPE DOREE. — *Buff. Hist. Nat. par Sonn.* XXV. p. 296.

CAPE MOLE. — *Shaw's Gen. Zool.* i. p. 521.

HABITAT

in capite bonæ spei.

Buffon has followed Seba in calling this a Siberian animal, but it is a mistake, the gilded mole being an inhabitant of the Cape of Good Hope.

W.

Siberian mole, with a very short nose; no ears; three toes on the fore-feet, on the outmost toe a very large claw; four toes on the hind-feet; body of an equal thickness; rump

a very short muzzle, the hair mixed with green and a gold-colour, and only three toes on the fore-feet, and four on those behind, while the common mole has five toes on all the feet. We are ignorant of the proper name of this animal.

quite round; no tail; of a beautiful green and gold colour, variable with the light. — *Penn. Synops Quadr.* p. 313.

THE GREAT MOLE OF THE CAPE OF GOOD HOPE*.

TO the new species of moles, we have added that which Messrs. Gordon and Allamand have described and figured by the name of the *great mole of the Cape*, or *down mole*; and which is, in effect, so large and thick, when compared with any other, that the name of great mole is quite sufficient to distinguish the species with ease.

"These moles," says M. Allamand, "inhabit the downs in the environs of the Cape of Good Hope,

* CHARACTER SPECIFICUS.

MUS MARITIMUS. M. brachyurus dentibus primoribus superioribus sulcatis, auriculis nullis, pedibus pentadactylis, corpore supra albido flavescente mixto, ad latera et subtus ex albo cinereo.—*Linn. Syst. Nat. Gmel.* i. p. 140. — *Schreb.* vi. p. 715, pl. 240.

LA GRANDE TAUPE DU CAP. — *Buff. Hist. Nat. par Sonn.* xxv. p. 283, pl. 12, fig. 1.

AFRICAN RAT. — *Penn. Quadr.* ii. p. 217.

COAST RAT. — *Shaw's Gen. Zool.* ii. p. 106, pl. 140.

HABITAT

in capitis bonæ spei collibus arenariis maritimis, quos cuniculis suis excavit. *W.*

and near the sea; they are not found in the interior of the country; the specimen we have figured, was a male; of which the length, from the muzzle to the tail, following the curvature of the body, was a foot; the circumference behind the fore-legs, six inches, and nine before the hind-legs; the upper part of the body was whitish, with a slight tint of yellow, that changed to a gray on the sides and under the belly.

"Its head was not round like that of the Cape mole, but long, and terminating in a flat flesh-coloured muzzle, like the snout of a hog: the eyes were very small, and the ears distinguished only by the opening of the auditory canal, placed in the middle of a round spot, whiter than the rest of the body; it showed two cutting teeth in each jaw, even when the mouth was shut. The upper teeth were much shorter than the lower; at first sight there appeared to be four in the upper jaw, on account of a deep slit in each, which appeared to divide the tooth in two, though it did not go through. There were eight grinders in each jaw: thus, with the cutting teeth, the number amounted to twenty in all: the lower teeth advanced beyond the upper; but the most remarkable singularity was, their being moveable, the animal being able to separate or unite them at pleasure; a faculty not found in any other quadruped to my knowledge.

"The tail was flat, and two inches six lines long; it was covered with long hairs, that (like the whiskers and the hairs beneath the feet) were

stubborn as hogs' bristles. There were five toes on each foot, provided with very long whitish nails."

We see by this description, that, if these animals much exceed the other moles in size and thickness, they resemble them in their eyes and ears; but there is a still stronger analogy: they live, like them, under ground; they make deep holes and long passages; they throw out the earth like our moles, and form large heaps, which makes it dangerous to go on horseback through places frequented by them, as it often happens that the horse sinks knee deep into the holes.

These moles must multiply exceedingly, for they are very numerous: they live on plants and onions, and consequently commit great havoc in the gardens near the downs. Their flesh is eaten, and is said to be very good.

They run slowly; and, in walking, turn their feet outwards like perroquets; but they are very expeditious in burrowing: they bite very hard, and it is dangerous to irritate them.

THE MOLE OF THE CAPE OF GOOD HOPE *.

I HAVE here given a figure of a mole found at the Cape of Good Hope, a stuffed skin of which was sent me by M. Sonnerat. This mole pretty much resembles the common species in the form of its body, in the eyes, in the ears, and in the tail; but it differs in the head, which is larger, and in the muzzle, which resembles that of a Guinea pig. The fore-feet are likewise different: the hair is not black, but dark brown, with a little yellow at the extremity of each hair. The tail is covered with large hairs of a yellowish

* CHARACTER SPECIFICUS.

MUS CAPENSIS. M. brachyurus, dentibus primoribus supra infraque cuneatis, auriculis nullis, palmis pentadactylis, ore albo. — *Linn. Syst. Nat. Gmel.* I. p. 140. — *Pall. Glir.* p. 172, pl. 7. — *Schreb.* iv. p. 713, pl. 204.

LA TAUPE DU CAP DE BONNE ESPERANCE. — *Buff. Hist. Nat. par Sonn.* XXV. p. 288.

CAPE RAT. — *Penn. Hist. Quadr.* ii. p. 218. — *Shaw's Gen. Zool.* ii. p. 111, pl. 140.

HABITAT

in Capite bonæ spei hortis infestus.

W.

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Plate 127

A. Bell Sculp.

MOLE of the CAPE of GOOD HOPE.

white colour; and, in general, the hair of this mole is longer than that of the European. From all these descriptions we may conclude, that it is a particular species, and that, though allied to the common mole, it cannot be regarded as a simple variety.

THE PENSYLVANIA MOLE*.

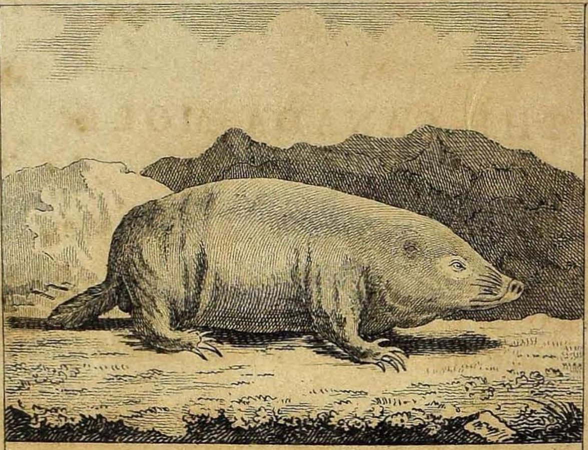
IN Pensylvania, says M. Kalm, there is a species of mole, which lives principally on roots. This animal digs (in the fields) small, winding, subterraneous alleys. In proportion to its size, it has more strength and rigidity in its paws than most other quadrupeds. In digging the earth, it uses its feet like oars. M. Kalm put one of them into his handkerchief; and he found, that, in less than a minute, it had made a number of small holes, as if the cloth had been pierced with a bodkin. It was very mischievous; and whenever it found any objects in its way, it immediately perforated them with its teeth. I presented to it, continues M. Kalm, my ink-piece, which was made of steel; it began to bite the ink-piece; but was soon repelled by the hardness of the metal, and never afterwards inclined to bite any thing that was held out to it. This animal does not raise the earth like the moles of Europe, but only makes small paths under the ground *.

These characters are not sufficient to give us a proper knowledge of the animal, nor enable us to decide whether it belongs to the mole tribe.

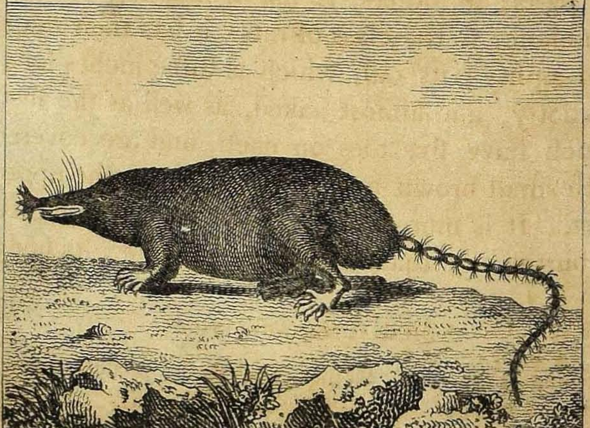
* Voyage de Kalm, tom. ii. p. 333.

374 A

Plate 128



GREAT CAPE MOLE.



Warner Sc

CANADA MOLE.

THE CANADA MOLE*.

THIS is a species which M. de la Faille has engraved in his continuation to his Memoire on Moles: he says that it has been found in Canada, and that it has not been noticed by any other author.

"This quadruped," says M. de la Faille, "only resembles the common mole in some of its parts; in others, it has a much greater resemblance to the class of rats: it has their shape and agility; its tail, which is three inches long, is knotty, and almost naked, as well as the feet, which have five toes on each, and are covered with small brown and white scales on the upper part. It is more above ground, or less addicted to burrowing, than the common mole: its body

* CHARACTER SPECIFICUS.

SOREX RADIATUS. S. nigricans, rostro producto, apice tentaculis radiato.—*Shaw's Gen. Zool.* i. p. 531.

LE TAUPE DE CANADA.—*Buff. par Sonn.* xxv. p. 280, pl. 12, fig. 2.

CANADA SHREW.—*Shaw's Gen. Zool.* i. p. 531, pl. 120.

HABITAT

in Canada. W.

is longish, and covered with coarse black hair: the feet are far less than those of the mole: the eyes are hid under the skin: the snout, which is furnished with a particular whisker, is neither pointed nor terminated by a cartilage proper for turning up the earth, but is edged with very fine fleshy muscles, that resemble spines: all these spines are of a bright rose colour, and are moveable at the pleasure of the animal, so as either to be brought together in a circular form, or expanded like a flower cup: they surround and close the nostrils, to which they form a shade: it is difficult to say for what purpose this extraordinary appendage can be used, except that of turning up the earth.

"This mole inhabits Canada, where, however, it is not very common; as it is obliged to pass the major part of its life under the snow, it accustoms itself to retirement, and seldom leaves its hole even in fine weather. It burrows like our moles, but much slower, as their hillocks are fewer and very small."

M. de la Faille has preserved the specimen in his cabinet from which his figure was engraved; and it is to him only that we owe our knowledge of this singular animal.

THE ZEMNI*.

IN Poland and Russia there is another animal called *ziemni* or *zemni*, which is of the same genus with the *zisel*, but larger, stronger, and more mischievous. The head is pretty thick, the body slender, and the ears short and rounded. It has four large cutting teeth, which project out of the mouth, the two in the under jaw being thrice as long as the two in the upper. The feet are very short, covered with hair, divided into five toes, and armed with crooked claws. The hair is soft, short, and of a mouse-gray colour. The tail is of a moderate size. The eyes are as small, and equally concealed, as those of the mole. Rzaczinski gives it the denomination of the *little earth dog*. This author seems to be the only one who mentions the zemni, though it be very com-

* ZITS-JAN. — *Le Brun, Voyag. Muscov.* vol. ii. p. 402.

BLIND MOLE RAT. — *Penn. Hist. Quadr.* ii. p. 214.

Zemni, with the cutting teeth of the lower jaw half as long again as those of the upper; eyes very minute, and as much hid in the fur as those of the mole; four toes, and a claw instead of the fifth, on the fore-feet; five on the hind; tail short; colour cinereous; size of a squirrel.—*Penn. Synops. Quadr.* p. 277.

mon in some of the northern provinces*. Its natural dispositions and habits are nearly the same with those of the hamster and zisel. It bites cruelly, eats voraciously, and lays waste the corn fields and gardens. It digs a habitation in the earth, and feeds upon grains, fruits, and pot-herbs, of which it lays up magazines in its retreat, where it passes the winter.

* Reperitur hoc animal in Podolia, Ukraina, Volhinia circa Suraz, Chodaki, Reinki, Mossezenica, Sezurowee, et alibi; non raro eruitur ab agricolis ibidem vomeribus. — *Rzaczinski, Auct.* p. 325 et 326.

END OF VOL. V.

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